cycles

—A MONTHLY REPORT

April 1953

FOUNDATION FOR THE STUDY OF CYCLES
New York, New York

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cycles

—a monthly report

The Official Bulletin of the Foundation for the Study of Cycles

VOLUME IV NUMBER 4 APRIL 1953

The Director's Letter

Dear Member:

The popularity of fortune tellers, astrologers, and economists proves how important it is to know what is ahead. The diversity of opinions in regard to the future which such people express, proves that most of them do not know the answers.

Within certain fields of science the situation is quite different. Astronomers do not advance differing opinions in regard to the date of the next eclipse of the sun. They **know.**

Not all fields of science are so fortunate. Forecasts of next year's weather are, as a rule, little better than forecasts of next year's business.

Even in the study of the tides, the astronomical basis of which is known, the most accurate projections of the tidal forces are often upset, in practice, by off-shore winds or on-shore winds, which on their part, in most locations, are, as yet, utterly unpredictable any great distance into the future.

In broad outline we probably know pretty much all that is to be known about the tides. The captain of the Queen Mary has his tide tables for New York harbor worked-out to a gnat's eyelash. But I will venture that neither he nor his pilot feel that they can rely on the tables to the exclusion of observation, judgement, and good horse sense.

The increasing knowledge of cycles in human affairs has not yet provided us with complete knowledge of the future. It never will. Even when we know all that is to be known of cycles we will know only part of the picture. Allowance must always be made for the effect of non-cyclic factors in business as in the tides. Even so, in spite of distortions caused by wars and other accidental non-cyclic factors, and in spite of our very rudimentary knowledge of cycles, projections of cyclic patterns do come true over longer periods of time and with greater reliability than forecasts made by any other method I know about.

Our Promotion Campaign

We are trying in every way we know to increase our membership to the break-even point and, hopefully, enough beyond that so that I can draw a salary.

To this end we are doing some advertising. We are also sending out some form letters to people who might profit from membership. Results are beginning to show.

Advertising is ordinarily aimed at those people who believe that it is possible to get great value for small expenditure.

In our direct mail letters we are following the opposite approach. We are addressing ourselves to the more conservative group who realize that they are not likely to get much more than they pay for; who realize that neither we at the Foundation research office, nor anybody else in the world, really knows what is ahead. From the study of cycles people can expect only some facts which, when added to a lot of other facts, may be of help.

You will find a copy of the letter we are using on page 119 of this report under the heading "Foundation Affairs." If you have any ideas for the improvement of this letter I hope you will write to me or to Mrs. Roessle.

Cooperative Effort

For the study of cycles we need long series of figures. These are hard to come by. I do, however, have a series of charts prepared by Mr. Cecil F. Elmes and published about 30 years ago by Sanderson & Porter. Two of these charts are being published on pages 117 and 118 of this report. Others will follow.

Cycle analysts cannot work with charts. They must have figures. No one seems to know where the figures are from which these charts were prepared, or the whereabouts of Mr. Elmes. The figures must be reconstructed.

Here, then, is the job which, as a labor of love, needs to be done. If you are interested, get a jumbo photostat of one of these charts to enlarge it several times so that it will be easy to read. Then read off and record the values, sending the final results to me. Only—and this is important—clear with me first to avoid duplication of effort.

The Predix Stock Market Charts

If you are a new member you may need a word of explanation in regard to the cycle study prepared by Mr. Vedder Hughey of Coral Gables, Florida, and published under the pseudonym of PREDIX.

The results of this analysis were published in three charts: Plate I reporting upon the long-term cycles which Mr. Hughey found in the market; Plate 1-A reporting upon the cycles of medium length and adding them to the synthesis; and Plate II reporting upon and adding to the synthesis some short-term cycles. Plate I (and a 24-page explanatory booklet) was reprinted for you in our March report. Plate 1-A and some additional explanatory material is being reprinted for you in this report, Plate II and Mr. Hughey's final combination and projection will be printed in the May report.

The research for Plate II was completed in April 1952. The plate itself was first published in June of that year. The extent to which market behavior since that time has conformed to Mr. Hughey's projection strikes me as quite encouraging. However, I continue to warn you that this forecast has not yet proved itself sufficiently to justify using it as a basis for action in the purchase and sale of securities. Watch it for awhile. And do not be misled by the excellence of the correspondence between the synthetic curve combining the cycles, and actual past behavior. You can use the wrong cycles and get good correspondence for the past. It is the way the projection into the future does or does not work that counts.

The 29.2-Month Cycle in Stock Prices

We have isolated a cycle in common stock prices from 1871 to date which, as closely as we can measure it, is 29.2-months long. More than this, we have isolated what seems to be the same cycle in copper prices from 1784 to date.

I have written an article about this cycle in common stock prices. I intended to print it for you at this time. However, including the charts, it turned out to be 13 pages long. There was no room for it in this report. To have included it would have thrown the whole report out of balance. However, I think I can fit it into the May report or the June report.

As soon as possible after reporting to you about this cycle in stock prices, I want to tell you about the 29.2-month cycle in copper prices and also about a cycle very close to this length in pig iron prices.

Glossary

In response to numerous requests I printed, in our January report, a Glossary defining about 30 words frequently used in cycle analysis. Sixty or seventy more words could be added to such a Glossary, and will be added as soon as space and time permit.

As we have a number of new members coming in at this time I thought that it might be helpful if I reprinted this January Glossary at the end of this, the April report. I have therefore done so.

Very cordially yours,

Edward R. Dewey

Director

Research

CYCLES IN SOLAR HEAT

RADIATION of heat from the sun varies in cycles, all of which seem to be unit fractions of 22 2/3 years (272 months), according to a paper by Dr. C. G. Abbot. This paper is based on more than 40 years of observations and study of this subject. Dr. Abbot writes me that he considers this paper his magnum opus.

"Unit fractions" are fractions where the numerator is 1 and the denominator is an integer, as 1/2, 1/3, 1/4, 1/5, 1/6, etc. Unit fractions of 272 months would be 1/2 of 272 months or 136 months, 1/3 of 272 months or 90 2/3 months, 1/4 of 272 months or 68 months, etc.

Dr. Abbot's paper is called "Periodicities in the Solar Constant Measures." It is published by the Smithsonian Institution of Washington D.C., of which Dr. Abbot was the head until he "retired" a few years ago. Copies of Dr. Abbot's paper can be obtained while the supply lasts, from the Smithsonian Institute for the small charge of twenty cents.

One dramatic thing about Dr. Abbot's paper is the extent to which the cycles he finds in solar radiation seem to have their counterpart in economic affairs here on earth. This suggests (a) that there may be a cause and effect relationship between solar heat and human activity, or (b) that the sun and human beings may both respond to some external cyclic forces, or (c) that the correspondence is merely coincidence—a possibility which must always be kept in mind in cycle study.

Solar Cycles Found

Although all the cycles Dr. Abbot found in solar radiation were unit fractions of 22 2/3 years (272 months), he did not find cycles to correspond with all the unit fractions. For example, he found cycles 1/3 of 272 months and 1/4 of 272 months, but he did not find any cycles 1/2 of 272 months. He found cycles 1/12 of 272 months, but did not find cycles 1/13 of 272 months, and so on.

The complete list of cycles found by Dr. Abbot and their amplitudes or strengths are given in Table A on page 107. Table B gives the length of the cycles **not** found.

The synthesis or combination of the 23 solar cycles listed in Table A would, of course, repeat very closely after 22 2/3 years (because they are all very close to unit fractions of 22 2/3 years and therefore all come together again after that length of time). If the observed cycles are real, solar radiation should therefore tend to repeat at 22 2/3-year intervals. This it does tend to do, as you can see from Dr. Abbot's Fig. 4-A, reprinted on page 107. The available data are too few to enable one to make an extended comparison, but as far as they go the correspondence is quite remarkable.

Comparison With Economic Cycles

If you want to make a detailed comparison of the cycles you find on earth with the cycles Dr. Abbot found on the sun you will want to know the calendar timing of Dr. Abbot's solar cycles as well as the wave length. This information can be obtained from his Table C, reproduced below.

It is interesting and provocative to compare the cycles present on the average in economic affairs with the cycles Dr. Abbot finds present on the average in solar radiations. For comparison suppose we take the cycles indicated by the multiple harmonic analysis of industrial common stock prices, January 1871—August 1897, as reported upon in CYCLES for May 1952, and list them in parallel with Dr. Abbot's cycles, as in Table D on page 108.

From a study of this table you will glean a number of interesting facts:

First, in both Dr. Abbot's solar radiation cycles and the stock market cycles, two cycles show up with lengths very close to 1/24th of 272 years. In both instances one cycle is slightly shorter and the other cycle is slightly longer than an exact 24th. In both series this is the only instance of two cycles where there "ought" to be but one.

I do not know whether or not this coincidence has any significance.

Second, Dr. Abbot's theory that all the cycles in solar heat are unit fractions of 272 months would call for 25 different cycles 10.4 months in length and up. He found thirteen of these lengths. Twelve he could not find. In the stock market for the interval chosen for comparison we find 25 cycles, spread out pretty much as Dr. Abbot's solar heat cycles ought to be spread out if his theory is correct. That is, for **each and every one** of the solar cycles which "ought" to be present we find a corresponding stock market cycle which **is** present. The stock market out-caesars Caesar. It behaves more nearly the way the sun "should" behave than does the sun itself!

This circumstance is quite provocative, but there are some monkey wrenches in the machinery—as usual.

For one thing, multiple harmonic analyses of later sections of the stock market (1897 to 1924, and 1924 through 1950) do not show these cycles with anywhere nearly the same degree of regularity.

Again, the work has not yet been done to prove that these stock market cycles (or all of the solar cycles for that matter) are truly rhythmic; that is, that they repeat time after time with a rhythm or beat.

And finally, although the correspondence of wave-length from cycles of 10.4 months long to cycles of 20.0 months long is very close, as the cycles get longer the differences in wave-length increases until, for the longest cycles, it averages about 10% longer for the earthly cycles than for the solar ones. In other words, the key does not quite fit. To force it will not unlock our mystery. If there is any identity of wave length between cycles of solar heat and economic cycles it is not the whole explanation of economic cycles. I think the furthest we can go at the moment is to record the facts and hope that someday we will have the explanation.

Third, it will immediately occur to students of cycles that Dr. Abbot's fundamental, of 272 months is almost exactly one half of the synodic period of Saturn and Uranus.

The synodic period of two planets may be defined, by extension of meaning, as the length of time between successive "lining up" with each other and with the sun. Suppose for example that you are looking down on the solar system and, at a certain instant, see two planets on the same side of the sun in line with the sun and with each other. As the planets have different speeds one of the two will pull ahead of the other on the race around the sun. The faster one will eventually gain a complete lap and catch up to the slower one from behind. At some instant they will be in line with the sun and with each other again. The difference between the two successive instants when the two planets and the sun are in line (one of the two having made a complete lap and something more in the mean time) is the synodic period of the two planets.

For Saturn and Uranus the synodic period is 544.32 months. One half of this interval is 272 1/6 months, only a sixth of a month different from Dr. Abbot's fundamental (the length of which all the other cycles are unit fractions). Dr. Abbot originally thought the length of the fundamental for cycles of solar heat was 273 months, but more careful measurements persuaded him that it was closer to 272 months.

If this coincidence has any signifiance I do not know what it is. To suggest any cause and effect relationship between one pair of planets and the sun would seem to get you into more difficulties than it would get you out of. First, how could the coming together of two planets cause the observed solar behavior? Second, even if you can figure out how it could—which I cannot—why would the coming together of all the other pairs of planets not cause similar cyclic behavior?

In respect to this coincidence, like the one between the solar and economic cycles, I think the proper thing to do is to hold our horses. Let us not jump to half baked conjectures. Let us hope that someday we will have the answers. In the meantime let us gather more facts.

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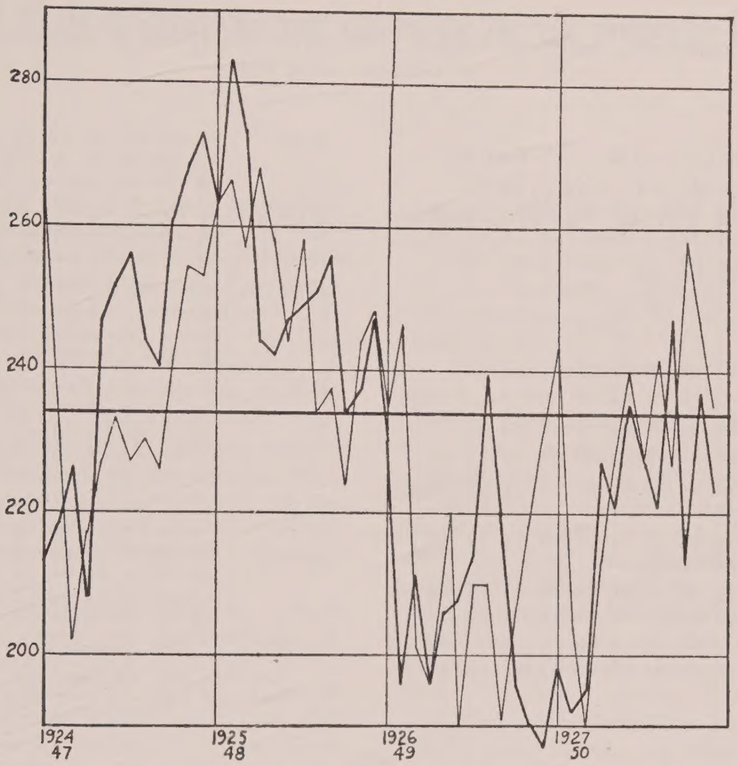

FIG. 4A.—Comparison of solar constants 1924-1927 (heavy lines) and 1947-1950 (light lines).

TABLE A

Periodicities confirmed *

Period Months	Amplitude Percent	Period Fraction of 272
2 1/7	0.05	1/127
3 1/20	0.05	1/90
4 1/3	0.06	1/63
5 1/18	0.05	1/54
6 1/30	0.12	1/45
7	0.08	1/39
8 1/14	0.06	1/34
9 1/10	0.08	1/30
9 7/10	0.10	1/28
10 6/10	0.06	1/26
11 1/5	0.17	1/24
11.43	0.11	1/24
12.0	0.20	....
13 1/10	0.11	1/21
15 1/6	0.09	1/18
22 3/4	0.07	1/12
24 3/4	0.12	1/11
30 1/3	0.13	1/9
34 1/2	0.15	1/8
39	0.20	1/7
45 1/2	0.13	1/6
54 1/2 †	0.13	1/5
68	0.25	1/4
91	0.12	1/3
272	...	1

TABLE B

Periodicities sought but not found

Period Months	Period Fraction of 272
4 1/2	1/60
5 1/2	1/50
6 1/2	1/42
7 5/6	1/35
8 1/2	1/32
10 1/9	1/27
10 9/10	1/25
13 6/10 †	1/20
14 4/10	1/19
17	1/16
18 1/5	1/15
19 1/2	1/14
21	1/13
24 8/10	1/11
136	1/2

TABLE C

Twenty-three solar periodicities in ten-thousandths of the solar constant, based on August 1920. Also the 12-month terrestrial period, same unit

2 1/7 M: +2 −2. 3 1/20 M: 0 −2 +2. 4 1/3 M: −1 −2 +3 ±0.

5 1/18 M: −1 ±0 −2 +2 +2. 6 1/30 M: −4 −1 +3 +6 ±0 −5.

7 M: −1 +1 +5 +2 −1 −1 −2. 8 1/14 M: −2 −2 −1 −1 +1 +1 +3 +2.

9 1/10 M: −2 −4 −3 −1 ±0 +2 +3 +1. ±0.

9 7/10 M: −4 −3 −1 +1 +5 +5 +2 −1 −4 −3.

10 6/10 M: −1 −1 −1 −1 −3 +1 +1 +2 +3 +1 −1.

11 1/5 M: −4 −2 ±0 +3 +1 +9 +3 −1 +4 −2 −8.

11.43 M: +7 +4 +6 +1 −3 −4 −3 −3 −4 −3 −1.

13 1/10 M: +1 +4 +3 −2 −6 −4 +2 +2 +1 ±0 −2 +1 +3.

15 1/6 M: −3 −6 −6 −1 ±0 +2 +1 +2 +3 +2 ±0 ±0 +2 +1 +1.

22 3/4 M: −1 +1 ±0 +1 +1 +1 +1 +1 ±0 ±0 +1 +2 +3 +3 +2 +2 +1 −1 −2 −3 −3 −2 −1.

24 3/4 M: −2 −2 −1 +1 +2 +3 +3 +4 +4 +4 +3 +3 +2 +1 ±0 −2 −5 −7 −2 ±0 ±0 ±0 ±0 −1 −1.

30 1/3 M: +6 +5 +4 +3 +3 +4 +3 +1 +1 ±0 ±0 ±0 −1 −3 −5 −6 −6 −5 −5 −6 −6 −4 −3 −2 −1 −1 ±0 +3 +3 +4.

34 1/2 M: −5 −6 −4 −3 −3 −2 −3 −5 −7 −6 −3 −1 −1 +2 +5 +6 +8 +7 +6 +4 +1 −1 ±0 +1 +2 +3 +3 +4 +5 +5 +2 +1 −1 −3.

39 M: −4 +1 +2 +2 +2 +2 +1 +1 +1 +2 +2 +4 +6 +8 +10 +10 +8 +7 +5 +3 +4 +5 +5 +4 +3 +3 +1 −1 −4 −6 −8 −10 −10 −10 −9 −9 −9 −8 −6.

45 1/2 M: −3 −4 −3 −3 −2 −1 ±0 +1 +1 +3 +4 +6 +6 +3 +2 +1 ±0 −2 −3 −1 −1 +1 +1 +2 +3 +2 +2 ±0 −1 −3 −4 −5 −4 −3 −2 ±0 +1 +1 ±0 −2 −3 −4 −2 −2 −1.

54 1/2 M: +4 +4 +5 +6 +6 +7 +7 +7 +7 +6 +6 +6 +5 +3 ±0 −1 −1 −1 −2 −4 −4 −3 −3 −2 −2 −2 −2 −3 −2 −3 −2 −4 −5 −4 −3 −4 −2 −3 −3 −4 −3 −2 −1 −1 −1 −2 −1 ±0 ±0 −2 −2 −1 +1 +2.

68 M: −7 −5 −4 −4 −4 −6 −6 −8 −12 −13 −12 −9 −5 −4 −2 −3 −2 −2 −8 −11 −11 −10 −6 −6 −4 −3 −4 −4 −3 −5 −5 −6 −5 −4 −4 −4 −4 −6 −7 −8 −7 −8 −6 −4 −2 ±0 +2 +4 +5 +6 +7 +8 +9 +10 +10 +11 +11 +12 +12 +11 +11 +10 +8 +5 +2 −2 −3 −7.

91 M: ±0 +1 +2 +2 +2 +2 +2 +3 +4 +2 +1 −1 −2 −3 −3 −3 −4 −4 −4 −3 −3 −3 −3 −4 −4 −4 −4 −3 −2 −1 ±0 ±0 ±0 ±0 ±0 −1 −2 −3 −3 −4 −4 −4 −4 −4 −4 −4 −4 −4 −3 −2 −1 ±0 +1 +2 +2 +3 +4 +5 +6 +6 +7 +7 +7 +7 +7 +6 +5 +4 +3 +2 +2 +1 +1 +1 ±0 ±0 −1 −2 −2 −3 −4 −4 −4 −4 −3 −2 −1 −1 ±0 ±0 ±0.

The 12-month period of terrestrial causation

Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
+0.1	+0.6	−2.1	−6.7	−0.9	+1.7	+1.4	+2.1	+4.3	+6.2	+13.2	+13.5

TABLE D

COMPARISON OF LENGTHS IN SOLAR CONSTANT AND STOCK MARKET (LENGTHS IN MONTHS)

FRACTION	UNIT FRACTION (HARMONIC) OF 272 MONTHS	LENGTH OF CYCLE IN SOLAR CONSTANT VALUES AS DETERMINED BY DR. ABBOT	DIFFERENCE BETWEEN UNIT FRACTIONS OF 272 MONTHS AND DR. ABBOT'S SOLAR CYCLES	LENGTH OF CYCLE IN STOCK PRICES AS INDICATED BY PERIODOGRAM, 1871--1897	DIFFERENCE BETWEEN UNIT FRACTIONS OF 272 MONTHS AND STOCK MARKET PRICE CYCLES
1/26	10.461	10.60	-.14	10.54	-.08
1/25	10.880	-	-	10.85	+.03
1/24	11.333	11.20	.13	11.1	+.23
		11.43	-.10	11.5	-.17
1/23	11.826	-	-	12.0	-.18
1/22	12.364	-	-	12.5	-.14
1/21	12.952	13.10	-.15	13.1	-.15
1/20	13.600	-	-	13.7	-.10
1/19	14.316	-	-	14.5	-.18
1 18	15.111	15.17	- .06	15.3	-.19
1/17	16.000	-	-	16.4	-.40
1/16	17.000	-	-	17.3	-.30
1/15	18.133	-	-	18.3	-.17
1/14	19.429	--	-	19.6	-.18
1/13	20.923	-	-	21.6	-.68
1/12	22.666	22.75	-.08	23.7	-1.03
1/11	24.727	24.75	-.02	25.8	-1.1
1/10	27.200	-	-	28.6	-1.4
1/9	30.222	30.33	-.11	31.2	-1.0
1/8	34.00	34.50	-.50	35.6	-1.6
1/7	38.857	39.00	-.14	41.6	-2.
1/6	45.333	45.50	-.17	50.4	-5.
1/5	54.400	54.50	-.10	60.5	-6.10
1/4	68.000	68.00	-.00	75.	-7.00
1/3	90.666	91.00	-.33	102.	-11.33
1/2	136.000		-	152.	-16.00
1	272.			305.	

THE 22 2/3—YEAR CYCLE IN THE ABUNDANCE OF THE EUROPEAN PARTRIDGE

DR. Leonard Wing has just come into my office to tell me that he has identified and confirmed the existence of a cycle 22 2/3-years long in the abundance of the European Partridge in Czechoslovakia. His data covered the 183 year period from 1727 through 1909. The raw figures represent the annual bag of partridge on an old Bohemian estate at Krumau in the Moldau River Valley. These data, converted to logarithms, are plotted in Fig. 1. A 23-year moving average trend has been added by means of a broken line. The eleven values at each end of the trend, which cannot be computed by the moving averages technique, have been added by inspection.

Deviations or departures from trend are shown by Fig. 2, which thus shows the percentages by which the actual values are above or below trend. That is, it shows what the curve in Fig. 1 would look like if the trend were pulled straight and made horizontal. The 22 2/3-year cycle is shown by means of a broken zigzag line. The zigzag is projected to diagram the behavior from 1909 forward if this cycle continued.

As for timing, the current crest of the ideal cycle comes at the end of April, 1952, the next low is 11 1/3 years later, in the autumn of 1963.

The amplitude or strength of the average cycle is considerable, running from an average of 68.7% of trend at time of low to 145.5% of trend at time of crest.

Further details about this cycle will be given in a paper by Dr. Wing to appear in a forthcoming **Journal of Cycle Reasearch.**

It is interesting that Dr. Wing should discover this cycle in these figures just at the time I was writing my article about Dr. Abbot's work on cycles in solar heat, printed on pages 105 to 108 of this report. If you read that article you will remember that all twenty-three of the cycles Dr. Abbot found in solar radiation were very close to unit fractions of 22 2/3-years. Dr. Wing's length for the main cycle in the abundance of the European Partridge, developed with complete independence, turns out to be identical, as nearly as can be measured with annual figures. Here a little, there a little, we are piecing the jigsaw puzzle together.

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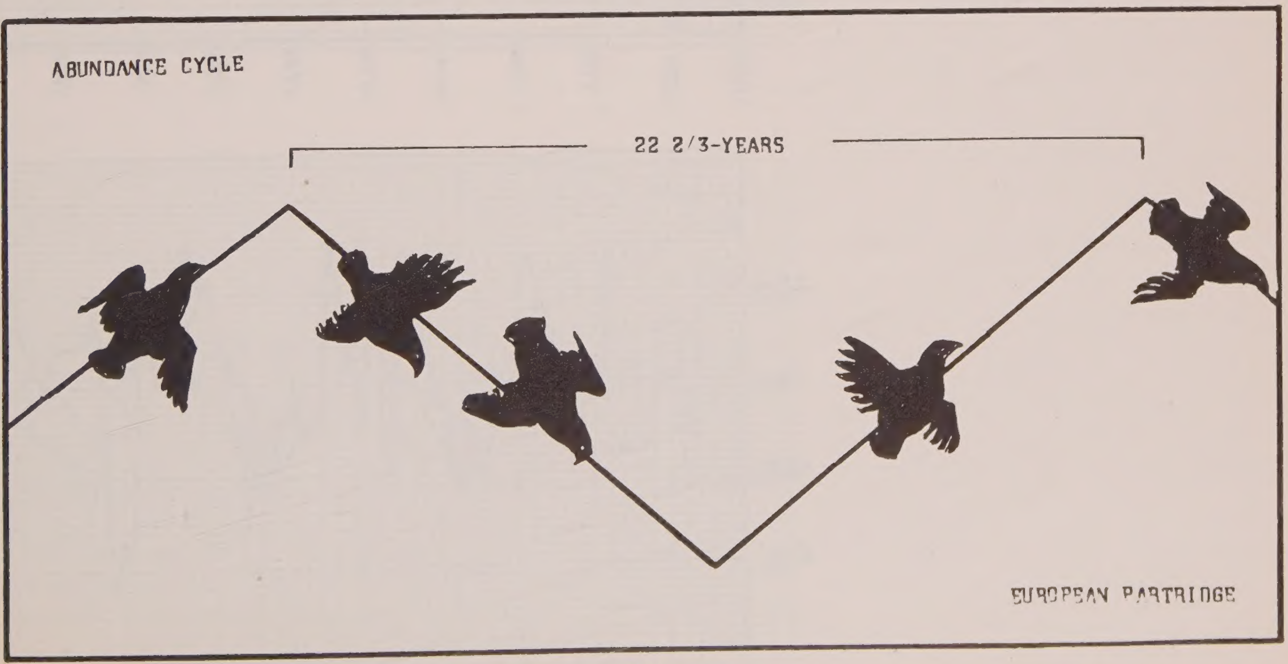

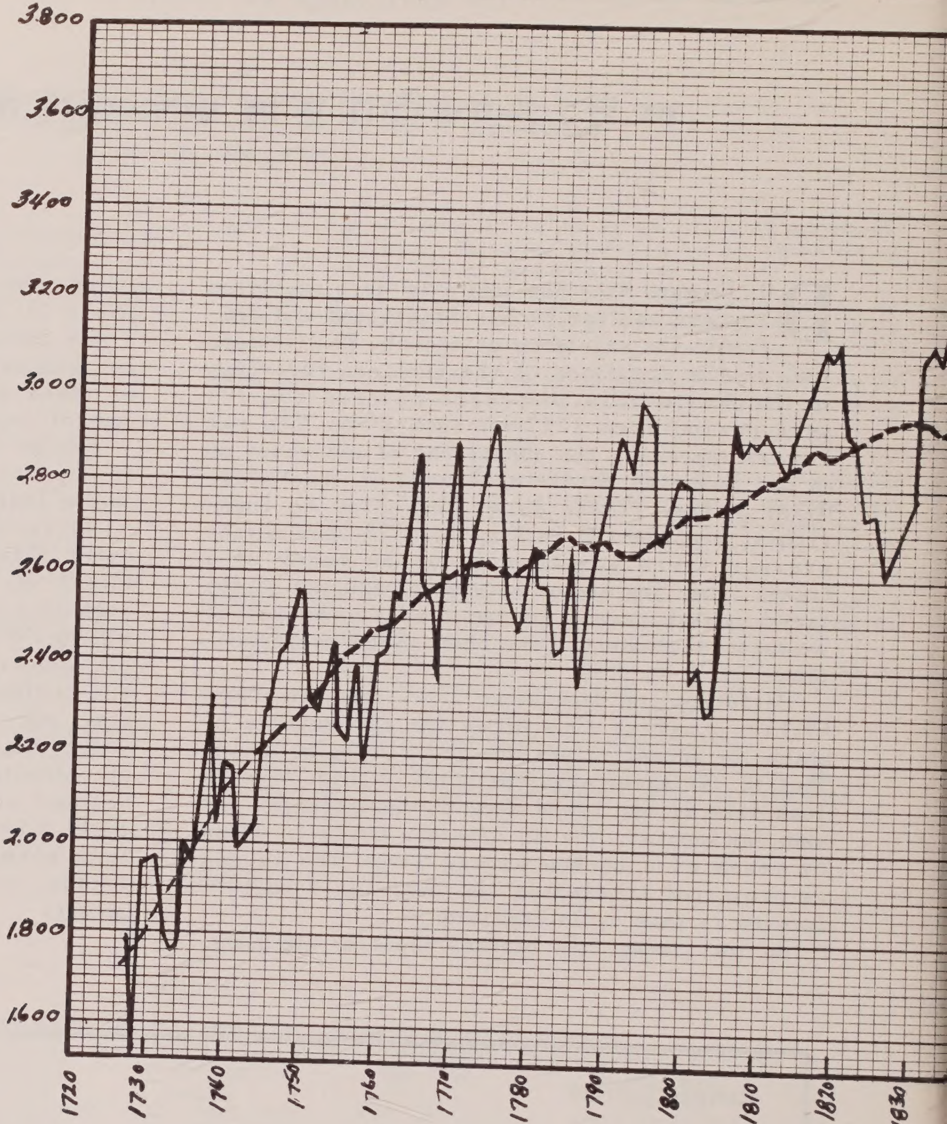
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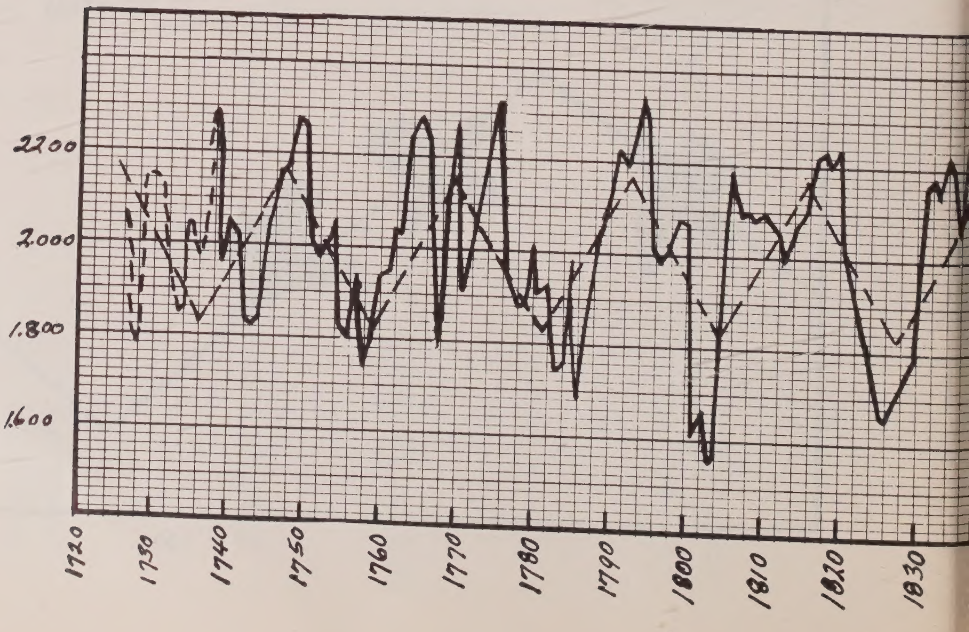
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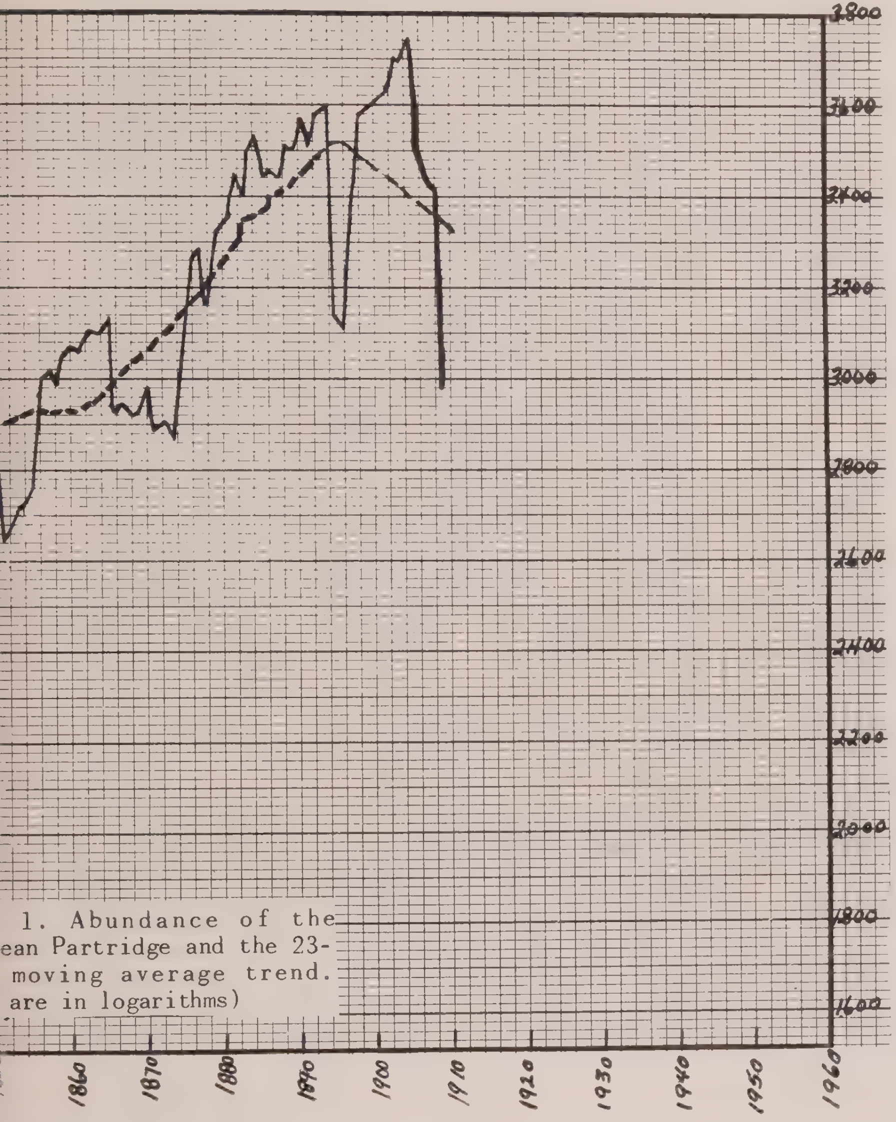

1. Abundance of the
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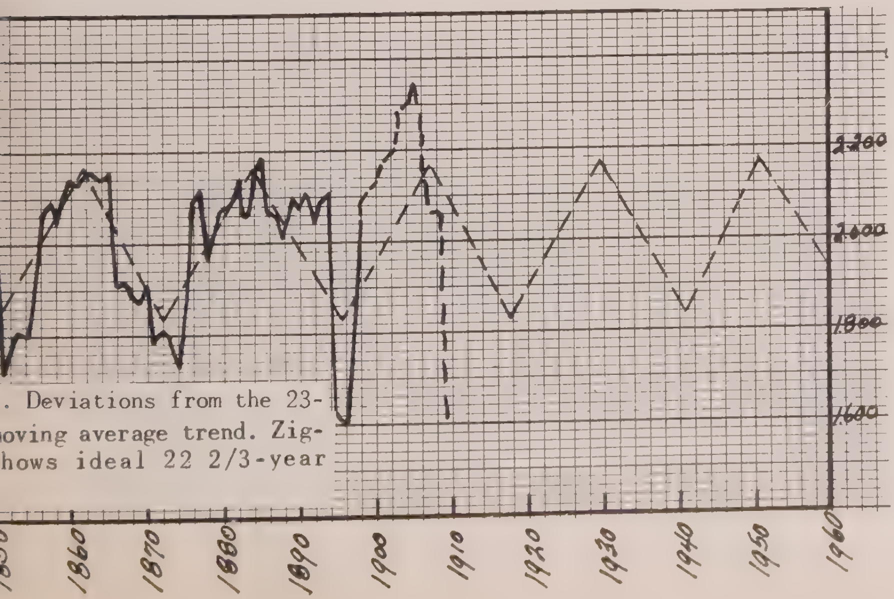
are in logarithms)



. Deviations from the 23-
oving average trend. Zig-
hows ideal 22 2/3-year

VARIABLE STARS

Did you know that several thousand of the stars in the sky fluctuate in brightness in regular cycles which vary in length from a few hours to several years, depending upon the star? The light curves of at least some of these stars fluctuate in the typical zig-zag pattern that characterizes many cycles in both solar and terrestrial phenomena.

For example refer to Fig. 245 below, reprinted from **Astronomy** by W. T. Skilling and R. S. Richardson, a book published and copywrited by Henry Holt and Co. These curves show that the stars to which they refer get brighter and fainter in the sort of a pattern that would result if some master hand pulled a reversing switch at more or less regular intervals.

Variable stars fluctuate in all sorts of wave lengths. The most usual lengths are 1/2 day, 7 days, and 250 days or 8.22 months (35.7 weeks). You can see the frequency of each of the various wave lengths by reference to Fig. 247 below, reprinted from the book referred to above.

What causes the change in brightness of the variable stars? No one really knows. "Several theories have been proposed," say Skilling and Richardson. "The most widely accepted of these is the pulsation theory, suggested by Shapeley. The gaseous star is supposed to be alternately expanding and contracting. The motion has been likened to the beating of a heart. As it expands it becomes brighter, and the spectroscope shows approach. As it contracts to smaller size the star gives less light, and naturally the Doppler effect is one of recession. Although there is no positive proof of the theory of pulsation it seems to explain very satisfactorily the changing brightness of these stars."

Variable stars represent only one aspect of the cycles in the heavens. Astronomy is the oldest cycle study of them all. Cyclic rhythms appear in planetary and lunar orbits; in solar, planetary, and lunar rotations. Comets have their cycles, as do sunspots and the aurora borealis. The earth's axial variations conform to an 18.6-year cycle. Even the 30,000,000 stars that compose our galaxy rotate in a cycle around the center of the system. For our sun this cycle is about 220,000,000 years.

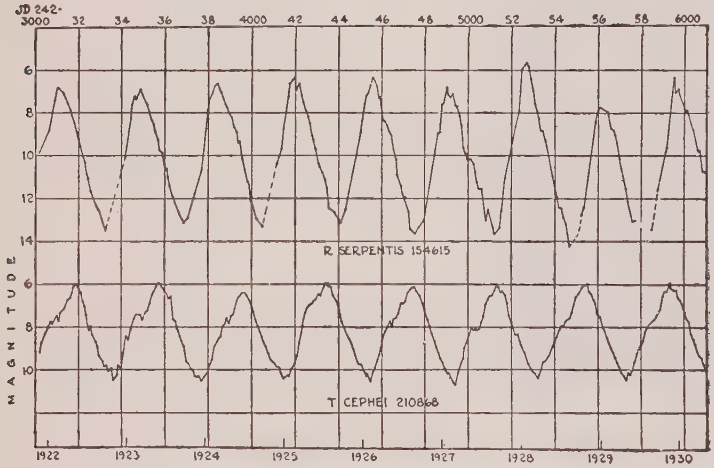


Fig. 245. **Light Curves of Long-Period Variables.** Light curves of two long-period red giant stars. Period of R Serpentis 357.2 days, of T Cephei 387 days. (Paul W. Merrill, Mount Wilson Observatory.)

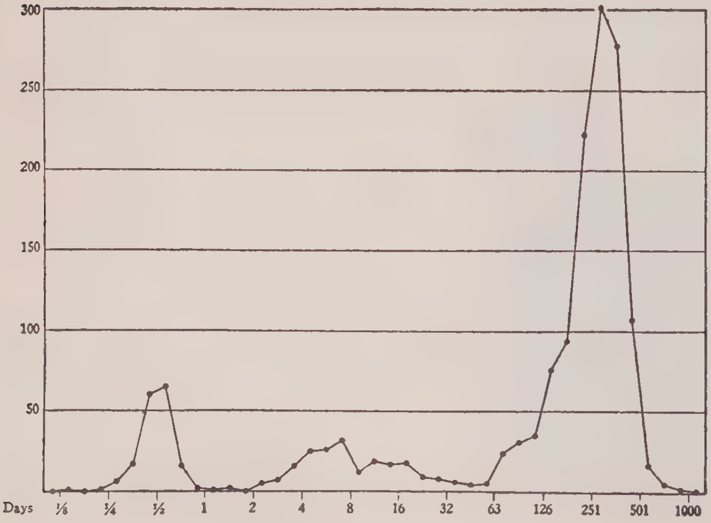


Fig. 247. **Frequency of the Periods of Variables.** Notice that the most usual periods are 1/2 day, 7 days, and 250 days. (Paul W. Merrill, Mount Wilson Observatory.)

THE LAW OF CYCLE LENGTH

NOBODY knows the law of cycle length. Nobody knows even if there is a law of cycle length--that is to say, a law governing the numerical relationship of the different cycle lengths to each other. But people have ideas!

Unit Fractions or Harmonics

One idea that appeals to the human mind is that cycles "ought" to bear a harmonic relationship to each other. That is, that there "ought" to be some master length and that all the other lengths "ought" to be unit fractions or harmonics of that length.

A unit fraction is a fraction the numerator of which is 1 and the denominator of which is a whole number, as 1/2, 1/3, 1/4, 1/5, 1/6, etc. Unit fractions are often called harmonics, the unit fraction 1/2 being called the second harmonic, the unit fraction 1/3 being called the third harmonic, and so on. Thus the unit fractions or harmonics of 60 years would be 1/2 of 60 years or 30 years, 1/3 of 60 years or 20 years, 1/4 of 60 years or 15 years, 1/5 of 60 years or 12 years, 1/6 of 60 years or 10 years, and do on.

You will notice that as the harmonics or unit fractions get smaller they get closer together. Thus, keeping to our example of 60 years, the difference in length between the fifth harmonic (1/5 of 60 years or 12 years) and the sixth harmonic (1/6 of 60 years or 10 years) is only two years, whereas the difference between the second harmonic (1/2 of 60 years or 30 years) and the third harmonic (1/3 of 60 years or 20 years) is 10 years.

The 50th harmonic of 60 years is 1/50 of 60 years or 1.200 years; the 51st harmonic is 1/51 of 60 years or 1.176 years. At this point on the harmonic scale there is a difference of only .024 years (1.200 - 1.176 =.024). As the harmonics get smaller and smaller there gets to be hardly any difference between them at all.

The Fundamental

The master length (60 years in the example given) of which the other lengths are harmonics or unit fractions is called the fundamental.

One trouble with this theory is this: If the master length or fundamental is of some moderate length—say 60 years, what would cause or govern the length of cycles of longer length—say 600 years or so?

The proponents of the harmonic idea have an answer to this one. They say, "Oh, the master length is much longer—perhaps 600 or 1200 or 1800 years long. A cycle of six hundred years might be the fundamental. It might be one half or one third of the fundamental. A ten year cycle is not necessarily the 6th harmonic; such a cycle might be the 60th harmonic."

Shorter Harmonics Close Together

This is a satisfactory answer, but it gets us into more trouble than it gets us out of. If the master length of which all the other cycles are unit fractions is many hundred years long, the shorter harmonics in which we are interested would come so close together that there would be a harmonic for any cycle we might be able to measure. For example in the 33 month range we find that the 218th harmonic of 600 years is 33.028 months long, the 217 harmonic is 33.180 months long only .152 months longer. As yet we just cannot measure cycles accurately enough to be sure that a given cycle is one or the other of these lengths, and not a length which, by accident happens to be pretty close.

Therefore, if harmonic relationships are the rule, and if the fundamental is several hundred years long, it is going to be almost impossible to prove this fact from a study of short length cycles. And except for tree ring widths and varve thickness (varves are layers of sedimentary rock deposits), we do not have any very satisfactory records to use to study long cycles.

Another difficulty that faces the proponents of the harmonic idea is that some of the longer cycles have been measured with enough accuracy so that it is clear that they cannot possibly be harmonics of any single master fundamental unless that fundamental is so long that it would have harmonics of almost every possible wave length in the shorter wave length brackets.

Perhaps Several Fundamentals

The "harmaniacs," if I may coin a word, get around that one by saying, "Perhaps there are several master lengths---several fundamentals. The cycles we see do not have to be harmonics of just one fundamental," In this of course they are right, too.

A final difficulty which confront the harmonic addicts is this: Why should nature cut off cycles at 600 years or 1500 years or 2000 years or any other length and have no cycles longer? If cycles are the result of electromagnetic forces why wouldn't it be reasonable to expect cycles of **any** length? The answer to this one is of course, "We do not know that the cycles we observe are the result of forces which are part of the electromagnetic spectrum. Perhaps the rotation periods of the planets, or the time intervals between their lining up with each other and the sun, or some basic resonance of the sun—any or all of these—provide the master length or lengths," You will have to admit, whatever their other faults, that these "harmaniacs" are ingenious!

Triple Progression

Another theory is that cycle lengths bear a triple progression relationship. That is, if you have a cycle 2 years long the proponents of this theory say that you "ought" to have another cycle three times as long or 6 years long; another one three times as long as that or 18 years; another three times 18 years (54 years); and so on.

This theory gets around the idea of some limiting master length because you can keep on multiplying (or dividing) by three as far as you wish. On the other hand it will not account for anywhere nearly all the cycles we know about unless you say (as the proponents of this idea do) that there are many different progression series. If you say this, you are right back where you were with the harmonic theory. That is, you have so many cycles in your theoretical set-up that you can find a theoretical length almost equal to any measured length, and our measurements of cycle length are as yet not exact enough to enable us to say for sure whether the actual length agrees with the theoretical length or not.

I myself have noticed some tendency for a 12-fold progression, that is, if you have a cycle of one length you may also have one 12 times as long (or 1/12 as long), but I advance this idea merely as a hint to be explored. I am not at all sure there is anything to it.

Mr. Drew's Theory

A third theory was advanced by W. N. Drew, and written up for you in our September 1952 report. He noticed that most if not all of the cycles which had been reported bore one of two simple mathematical relationships to each other.

These relationships can be expressed by the formulae:

$$L = \frac{N^{1.9975}}{48.694} \quad \text{or} \quad L = \frac{N^{2.0143}}{54.866}$$

when L is the length of the cycles in years and N represents successive integers.

One thing I like about Mr. Drew's approach is that it is based upon facts as he finds them and not upon preconceived notions of how things "ought" to be. I do not go in much for this "ought" business. However, in fairness to the triple-progression boys and the harmonic boys I suppose one should admit that their ideas are based on facts as they have seen them, too.

Mr. Drew's theory is all right as far as it goes, but the trouble with it is that there seem to be many additional cycles the length of which do not conform to the formulae, which have been discovered subsequently.

Longer Cycles Separated More

One thing that all of these theories have in common is that the longer cycles are separated from each other, percentagewise, more than the shorter cycles are. This means that if any one of these theories is true, and if you have an equal number of cycles with which to work, you should be able to get a better idea of the laws governing the interrelationship of cycle length by studying long cycles than by studying short cycles. That is one reason why the study of long cycles is so important.

Tyndall's Quotation

I have my own notions in regard to what may be the law governing the relationship of one cycle length to another, but I am by no means sure that I am right. I try to keep my ideas in the background as it is so easy, with the best intentions in the world, to try to fit the facts to the theory instead of the other way around. We need a lot more facts before it is safe to spin theories.

My favorite quotation is from the great British physicist Tyndall who said somewhere, "An idea in an empty head has the time of its life because it can rotate in any orbit it chooses without having any facts to bump into."

First let us get our facts, by the most careful measurement and observation of which we are capable, and then let us create our theories to fit the facts as they really are instead of as they "ought" to be!

erd

How it Came Out

THE 6-YEAR CYCLE IN ARMCO STEEL

WE have two pages available in what Mr. Vedder Hughey calls our "How It Done Do Department" which I am going to use to bring up to date the work done in 1949 in regard to the 6-year cycle in the sales of the Armco Steel Corporation.

In the Director's Letter for March I said I was not going to print any more of the charts showing the 6-year cycle in the sales of individual companies until we could get 1952 figures, but for the sake of our new members I finally decided to print one more.

Charts for the other 23 companies will be brought up to date and printed as figures become available and as space permits.

It must always be remembered that the 6-year cycle in only one of the rhythmic cycles present in these various series of figures. A more comprehensive study to isolate the other cycles should enable you to make greatly improved forecasts.

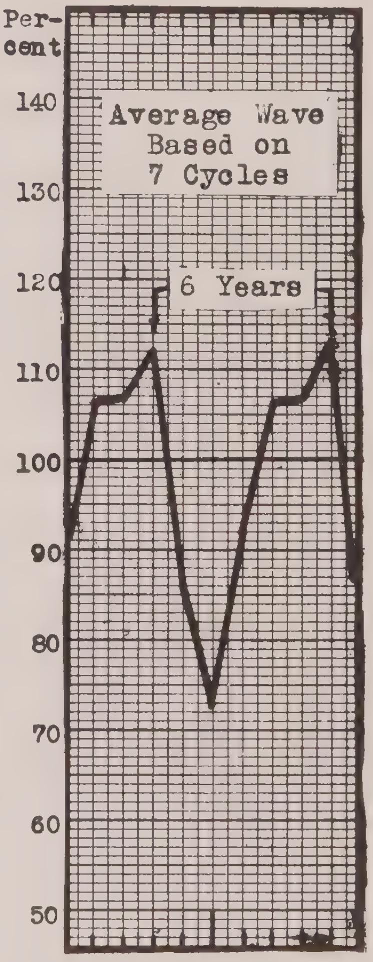
When these studies of the 6-year cycle in the sales and/or production of various individual companies were first made we had no thought of using them as forecasts. We considered them too crude for such a purpose. What we were trying to do was to see the extent to which the 6-year cycle might or might not be present in many different sorts of natural and social phenomena. What we found was reported upon in full in our report for December 1950.

Figures for the dollar sales of the Armco Steel Corporation are available from 1901 through 1951. They and their trend are plotted in Fig. 1 on the following page.

The percentages by which the actual figures are above or below trend are plotted in Fig. 2 on the same page. A 6-year cycle in these figures from the beginning is clearly evident. A perfectly regular ideal 6-year cycle is diagrammed in Fig. 2 by means of a broken zigzag line. This zigzag is projected into the future to show in a general way what will happen if this behavior continues.

An average wave based on seven cycles is shown on this page. This average wave shows a variation from about 73% of trend at trough to about 112% of trend at crest.

You will notice that the average wave has a sharp bottom and a flat top. We have assumed that crests come ideally in 1954 and six years forward and backward from that date and that troughs come ideally three years after crests.



Of the eight crests where we can know the facts (1905 through 1948) two came exactly at ideal timing, three came one year late, and three came one year early. Of the eight troughs in the same interval, four came exactly on time, two came one year early, one came one year late, and one, the first one, came three years late.

If typical behavior continues, a peak in the sales of this company, relative to trend, should occur in 1954 or a year one way or the other from this time. This peak should be followed by relatively poor sales due ideally to reach their trough in 1957.

erd

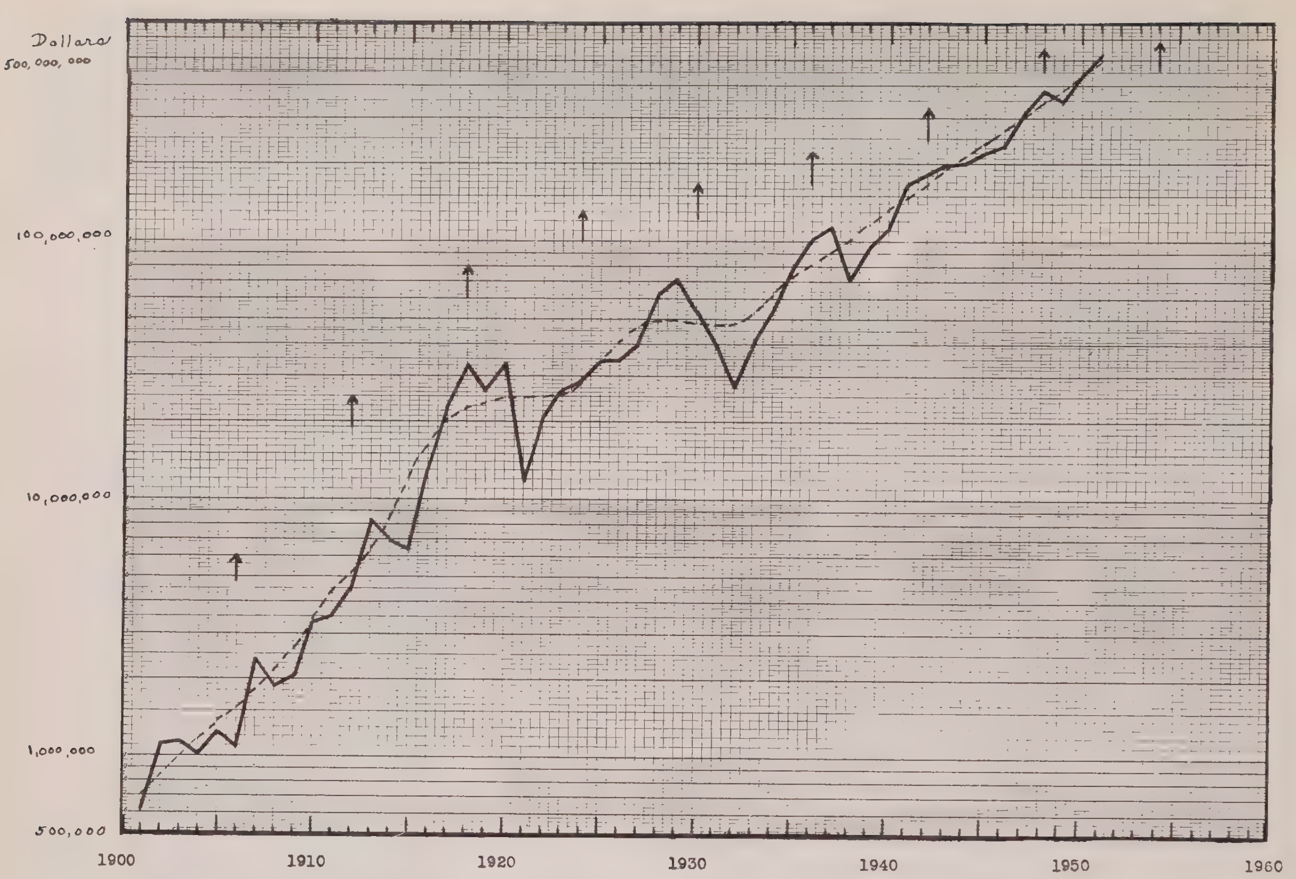


FIG. 1. ARMCO STEEL CORPORATION, DOLLAR SALES, 1901-1951, TOGETHER WITH A SIX-YEAR MOVING AVERAGE TREND (FIRST AND LAST THREE VALUES ESTIMATED. ARROWS INDICATE TIME OF IDEAL HIGH OF SIX-YEAR CYCLE. RATIO SCALE.

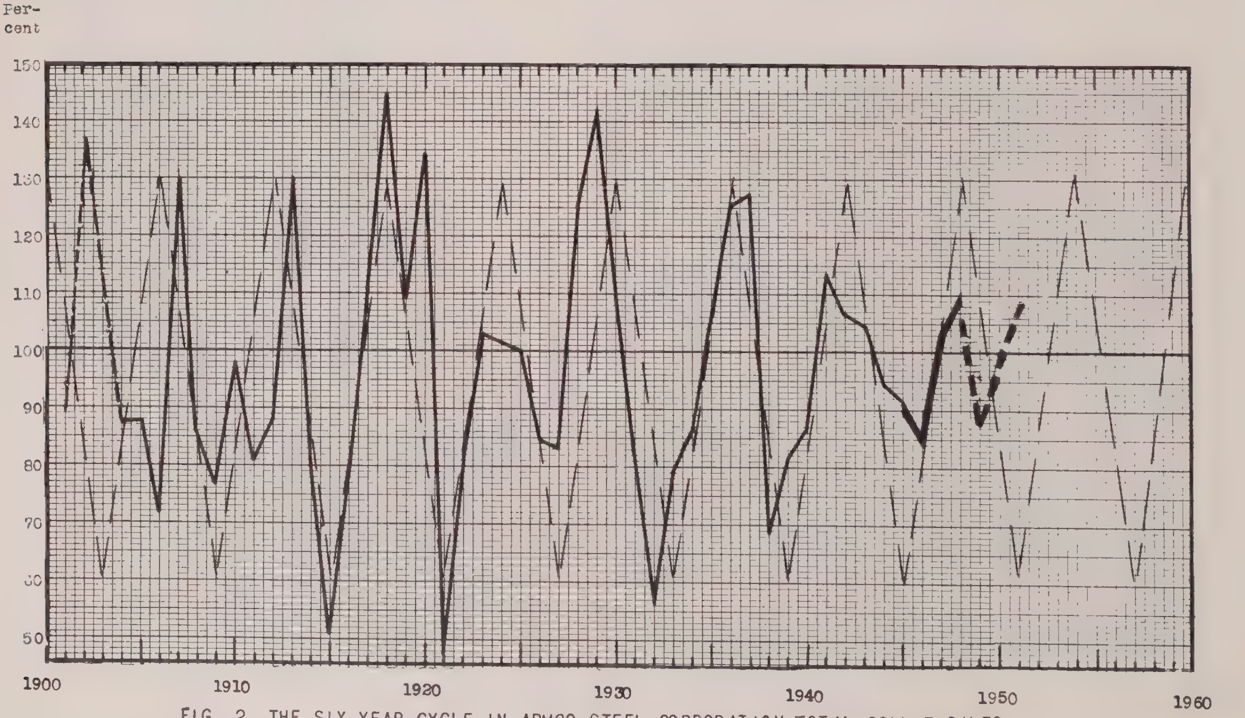
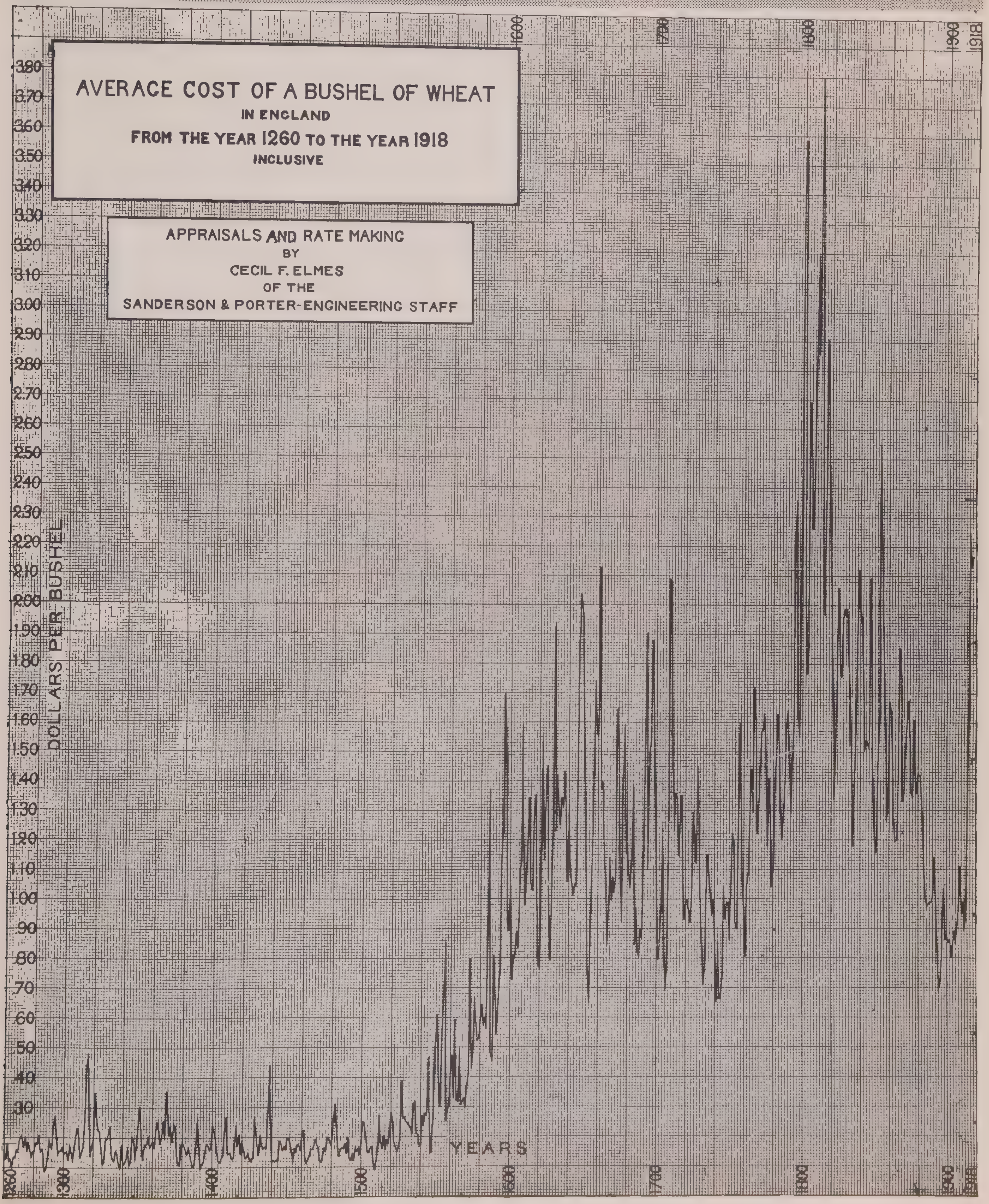


FIG. 2. THE SIX-YEAR CYCLE IN ARMCO STEEL CORPORATION TOTAL DOLLAR SALES. DEVIATIONS OF THE ACTUAL SALES FROM THEIR SIX-YEAR MOVING AVERAGE. BOLD LINE SHOWS HOW THE FORECAST HAS WORKED OUT.

Data


AVERAGE COST OF A BUSHEL OF WHEAT
IN ENGLAND
FROM THE YEAR 1260 TO THE YEAR 1918
INCLUSIVE
APPRAISALS AND RATE MAKING
BY
CECIL F. ELMES
OF THE
SANDERSON & PORTER-ENGINEERING STAFF
DOLLARS PER BUSHEL
YEARS
3.80
3.70
3.60
3.50
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3.30
3.20
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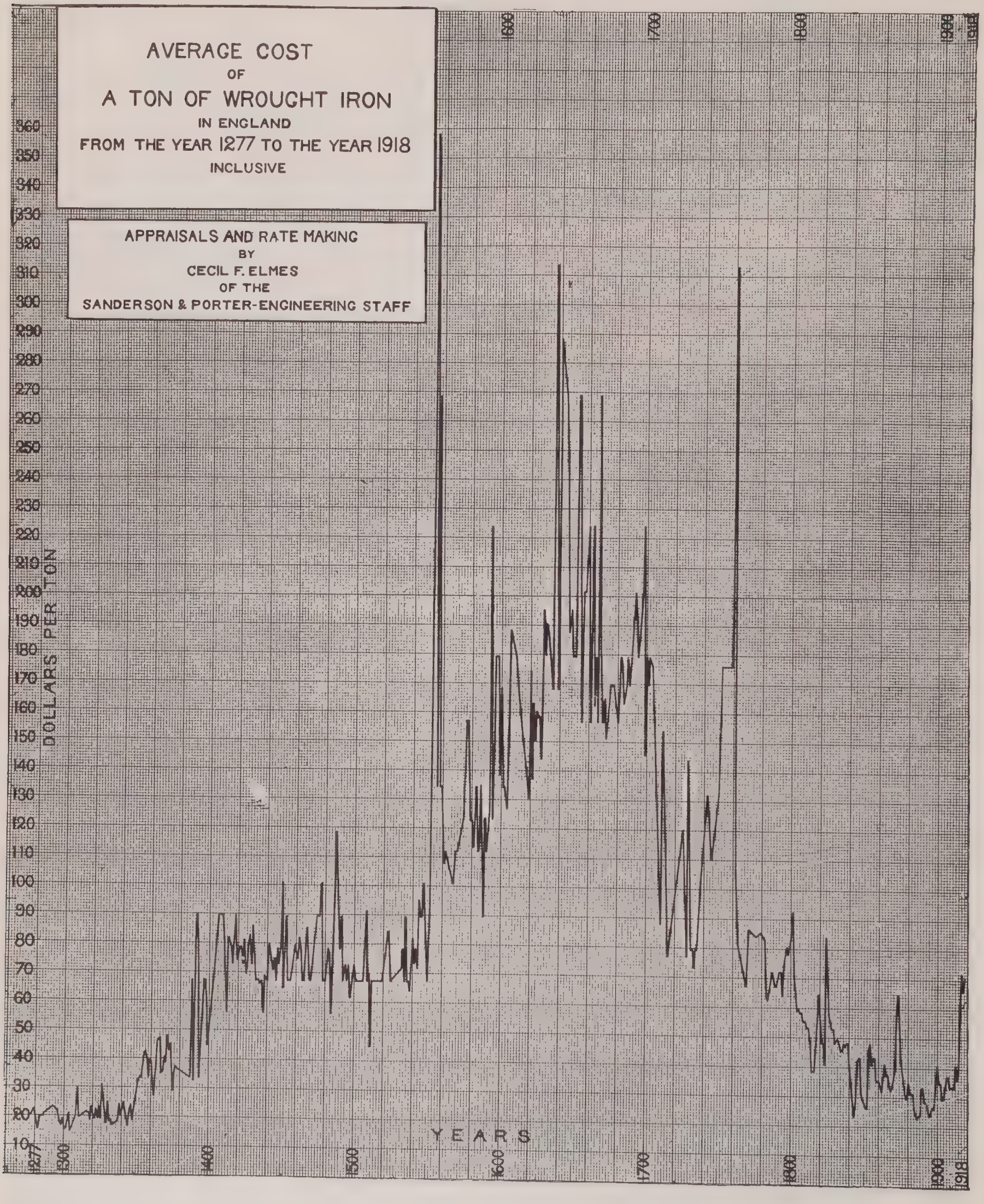

AVERAGE COST
OF
A TON OF WROUGHT IRON
IN ENGLAND
FROM THE YEAR 1277 TO THE YEAR 1918
INCLUSIVE

APPRAISALS AND RATE MAKING
BY
CECIL F. ELMES
OF THE
SANDERSON & PORTER-ENGINEERING STAFF

DRIVE FOR NEW MEMBERS

DURING the last two months we have been conducting a drive for new members. We hope to get enough members so that the membership division will be self-supporting. More than that, in time, we hope to have enough members so that your Director can draw a salary.

Our winter 1953 drive for new members pretty largely took the form of a printed letter and return envelope sent to selected individuals of importance in various sections of the country.

The letter read like this:

YOU DO NOT NEED TO READ THIS LETTER, BUT DO SEE THE CHART!

Maybe we know **even less than you do** about the future of general business, the stock market, etc. I do not know. But, in common with you, we are doing our best to find out.

Cycles-A Monthly Report, which records the results of our research, makes only "iffy" predictions. Sometimes I wonder why people pay $10 a year to receive it, but they do (many old members send in $25, $100, or even more).

Moreover, our growth (95% in the past two years) and our astonishing renewal rate (81% last count) must mean that people find our work valuable, or interesting,—or something. Ten dollars is $10, even today. Maybe people find our humility refreshing.

No one can outguess the future accurately, but we are making a stab at it—we believe with more than a glimmer of success. Believe it or not, forecasts based on cycles (repetitive patterns) sometimes come true!

For example, eight years ago our director, as a bit of scientific picture painting, made a chart of certain repetitive stock market patterns. He projected them 40 years into the future. Greatly to his surprise the darned thing has worked with amazing accuracy ever since. He calls it beginner's luck. He says the chart isn't good enough for a prudent man to follow. But of course it **might** continue to work—who knows? Anyhow, it is worth watching.

A similar projection of pig iron prices made in 1874 by a man named Benner worked for 65 years with a gain-loss ratio of 31 to 1. Things like this **can** be done. But our director says that even this forecast isn't safe to rely on either. Gloomy guy, isn't he?

Perhaps you will be disappointed if you become a member. We hope not, but who can tell? Therefore, if you are, we will be delighted to refund your money **in full** as per unconditional guarantee on the envelope enclosed. So, what do you have to lose?

If, with your first report you wish a complimentary copy of a stock market projection also, just check the box.

Very cordially yours,
Gertrude E. Roessle
Secretary

P. S. There have been only **two** requests for refunds in the past two years!

(The stock market projection referred to was printed for you in our June 1951 report. Benner's forecast of pig iron prices was printed for you in our report for February 1952.)

The results from this letter have been quite gratifying. I will give you a full report when all the returns are in.

In the meantime you may be interested to know that during 1952 our membership increased from 1,011 to 1,308, a net increase of 297 during the year. erd

Letters

Dear Mr. Dewey:

Your article on the 33-month cycle in the sales of Company G. leads me to hope that you will soon devote space in "Cycles" to a discussion of my researches on the 30-month cycle. My 1924 and 1928 articles referred to it as a 28-month cycle, but in recent years the length has been upward of 30 months.

I enclose a graph of the temperature at St. Louis since 1906. The data used are the monthly means of the daily maximum temperatures at St. Louis, combined into two 12-month means, and centered January 1 and July 1. The dates of maximum percentages of northern spottedness are indicated by N, and the dates of minimum temperature by —. The time-lag of the temperature dates averages 1.25 years. Also shown are dates of maximum rainfall in the region embracing the states of Missouri, Illinois, Kentucky, Tennessee, and Arkansas. These rainfall and temperature dates include opposition of phase.

A rough estimate of the average length of the cycle in these data gives 32.6 months, a value close to your estimate of the length of the sales cycle, 32.8 months. The amplitude of the temperature variation is great enough to be reflected in the sales of certain manufactured products, also in the yields of crops in restricted areas.

You will note that the curve of temperature has trended upward since 1951.0, and is due to crest about 1952.5.

Sincerely yours,
H. W. Clough

Castile, New York

Dear Mr. Dewey:

On page 232 of the September Report you mention a new article on the 46-month cycle in stock prices. I wonder if you refer to an article on the same subject on page 11 of Barron's issue of July 30, 1952.

The article I saw is totally worthless for any practical purpose and to my mind is the sort of thing that can cast ridicule on the whole theory of cycles. The writer purports to have discovered a 46-month rhythm in a long price series, then proceeds to prove it by the following remarkable statements:

"In only two instances did the index of prices fail to reach a higher level in the year in which the top of the cycle was reached than in the preceding low year of the cycle."

"The index was lower in every instance in the year in which the bottom of the cycle was reached than it was in the preceding crest year of the cycle."

As to the first statement, the author might have "had something" if he had been able to say that the high point for each year in which his cycle high occurred was almost always higher than the **high** point of the preceding low cycle year, but the accompanying table makes it clear that he is making the comparison with the **low** point of the previous low year. Similarly, the second statement compares low points of low cycle years with high points of the preceding crest year, finding it remarkable that in all cases the former are lower.

He could have said much the same thing with a great deal less bother (and without the aid of cycles) if he had simply stated that the high point for any year is usually lower than either the preceding or next year's high point. In fact this is necessarily so unless it should happen that a price "gap" occurs between the closing prices of one year and the opening prices of the next, with the market moving decisively at the turn of the year in a direction which continues generally throughout the new year. The only near exception I can find in the Dow Industrial Average, back to 1897, is for 1950-1951 Based on closing prices only, a gap occurred between December 31 and January 1 which was not closed during 1951, but based on daily highs and lows there was no price gap between these years.

Very truly yours,
Howard R. Sherman
Boston, Massachusetts

In answer I said:

Dear Mr. Sherman:

The article I mentioned in the September report and which I printed in the October report was the article you refer to.

I hope that my comments in regard to this article clears up some of the points raised in your letter.

The fact that prices were higher in the years of high than they were low in the years of low does not, as you say, mean anything. It is the **amount** by which they are high in years of high as compared with years of low that seem to me to have significance.

I note what you say about comparing the high in the year of high with the high of the previous year of low. This would be a worth-while comparision if it were not for the upward trend that has characterized stock prices for as far back as figures are available.

As I stated in my comments, the evidence of a 46-month cycle does not rest upon this work alone and I think the article I printed is stimulating and provocative and should spur on all of us to the effort necessary to pin the matter down and see why it is, in addition to trend, that the highest values in years of high are higher than the highs in years of low on either side.

Thank you again for writing me.

Very cordially yours,
Director

Dear Mr. Dewey:

Your Director's Letter as always, was very thought provoking. It particularly brought to mind a conversation that I overheard a short time ago. My business does not directly involve me with any particular aspect of music. Besides, I'm tone deaf... ... Well anyway, a group of musicians (amateurs) were discussing songs and a definite pattern in which they seem to have revivals.

None of the participants in this conversation are in the least bit interested in cycles. They were asked. The discussion was glib. No definite results were established. Yet after reading your Letter I thought you might be interested in the nebulous results: About every 14 years a song seems to become eligible to be revived. I say 'eligible' because no one could explain to me what original success the song had to have in order to qualify for revival.

If you can gather from the above comment some thought or idea about cycles that you have not been pursuing I would be very glad. Or yet some student may find the necessary field to make him interested in the study of cycles.

Hurriedly,
James A. Krentler
Colorado Springs, Colorado

Additions to the Library

"Severe Winter Ahead" by Halbert P. Gillette, reprinted from **Water & Sewage Works**, December 1952. Two pages, one chart. Gift of the author.

This paper advances the suggestion that weather cycles are caused by currents of electricity between the sun and the planets. The author finds many cycles which conform to his theory.

I imagine that Mr. Gillette, who lives in San Marino, California, would be glad to send you a copy of this reprint, if your request is received before his supply is exhausted.

* * *

"The Genetics of the Colour Phases of the Red Fox in the Mackenzie River Locality," by L. Butler, reprinted from **Canadian Journal of Research**, D, 25: 190-215, December 1947, National Research Council of Canada, 26 pages, 4 tables, 8 figures, references. Gift of the author.

Although, as the title indicates, this paper deals chiefly with genetics, it does discuss to some extent the cyclic abundance of Canadian foxes. These animals "become abundant every four years in northern Quebec and every nine years in the south of the province."

The author shows that, since they are connected with the population cycle, migrations tend to be rhythmic.

* * *

"Ruffed Grouse Populations in Minnesota in Relation to Blood and Intestinal Parasitism," by Arnold B. Erickson, P. R. Highby, and C. Edward Carlson, reprinted from **The Journal of Wildlife Management**, Vol. 13, No. 2, April 1949; 7 pages, 6 tables, references. Gift of Dr. Erickson.

The authors of this paper find more intestinal parasites in ruffed grouse in Minnesota when this cyclic species is on its way to population recovery. This fact suggests that the abundance of these parasites in ruffed grouse is cyclic also.

* * *

"Productivity and Yield of the George Reserve Deer Herd," by E. C. O'Roke and F. N. Hamerstrom, Jr., reprinted from **The Journal of Wildlife Management**, Vol. 12, No.1 , January 1948, 9 pages, 1 table, references. Gift of Dr. Hamerstrom.

Dr. O'Roke is Associate Professor of Forest Goology at Michigan and Dr. Hamerstrom is Curator of the Edwin S. George Reserve Zoological Museum, Michigan.

This paper contains data of deer population of the George Reserve deer herd 1933-34--1946-7 which may be of some value to students studying cycles in other longer animal population abundance series.

* * *

"Predation and Vertebrate Populations," by Paul L. Errington, Iowa State College, Ames, Iowa, reprinted from **The Quarterly Review of Biology**, Vol. 21, No. 2, June 1946, pp. 144-177, 102 pages, references. Gift of Dr. Errington.

This paper deals with the effect of predation upon population but does not treat cycles as such to any great degree.

* * *

"Fluctuations in Gray Fox Population in Pennsylvania and Their Relationship to Precipitation," by Neil D. Richmond, reprinted from **The Journal of Wildlife Management**, Vol. 16, No. 2, April 1952, pp. 198-206, 9 pages, 5 figures, 2 tables.

This paper gives an index of gray fox population in Pennsylvania, 1915--1949, shows a cycle of about ten years in the index, and shows a corresponding cycle in the frequency of Pennsylvania precipitation. However, as the author says, there have been too few of these fluctuations to determine whether or not they are true periodic occurrances.

A FOUNDATION REPRINT

CYCLICAL ANALYSIS

Industrial Common Stock Index

1854 - 1951

PREDIX

P. O. BOX 1245 DEPT. A
CORAL GABLES, FLA.

PLATE I–A

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EDITOR'S NOTES

In our March report we reprinted for you, as a supplement, the first of the three PREDIX plates reporting upon Mr. Vedder Hughey's cycle analysis of common stock prices. We also reprinted for you a 24 page booklet of explanation and an additional article by Mr. Hughey in regard to technique.

The cycles found by Mr. Hughey and reported upon in Plate I had the following lengths:

2.82	years	(33.8 months)
3.38	"	(40.6 ")
4.88	"	(58.6 ")
6.00	"	(72.0 ")
7.22	"	(86.6 ")
7.70	"	(92.4 ")
8.50	"	(102.0 ")
9.20	"	(120.0 ")
10.00	"	
10.65	"	
12.00	"	
13.50	"	
16.00	"	
18.30	"	
19.50	"	
23.25	"	
30.00	"	
37.50	"	
51.50	"	

Plate I-A and the accompanying tables, reprinted on the following pages, correct, refine, and amplify Plate 1 by adding and/or substituting cycles as follows:

7.40	years	88.8	(months)
5.56	"	66.7	"
3.94	"	47.3	"
3.06	"	36.7	"
2.56	"	30.7	"
2.25 2.50	"	27.0 30.0	"
2.02	"	24.2	"
1.92	"	23.0	"
1.83	"	22.0	"
1.56	"	18.7	"

In addition to Plate I-A and the tables, we are reprinting the "Test Forecast" on page 127 of this issue.

May I repeat at this point some comments in regard to this material which I made in the Directors Letter for March 1953? In that letter I said:

> Now let us get some things straight about these projections, their strengths,— and their weaknesses.

A Competent Job

First of all, I have every reason to believe that Mr. Hughey has done an honest and a competent job. There is no secrecy about any of his work. His methods are fully revealed. Any competent person could duplicate his work and, presumably, obtain the same answers.

I will go further than that. I will say that in the present limited state of our knowledge about cycles, I do not think anyone could have done a better job, **for the time and money spent.** With more time and more money the job could doubtless be improved considerably.

Limitations

On the other hand, as Mr. Hughey would be the first to tell you, his work—like **all** cycle work until we know much more—is subject to many limitations. More particularly—

1. The data with which he had to work were not homogeneous.

2. Some of the cycles found by Hughey may have been cycles present in the original series purely by accident. Such cycles have no significance whatever and of course will not continue.

3. Hughey almost certainly has missed some of the cycles really present.

4. Hughey may not, in all instances, have determined the timing, shape, strength, and lengths of the component cycles with sufficient accuracy. It is particularly important that cycle length be determined with the greatest accuracy.

For example, if there should be a cyclic force influencing stock market prices with a period or length of 3.045 months and

Hughey determined this length to be 3.050 months, the first month his cycle will be out of step with reality by .005 months. In ten cycles it will be out of step about .05 months. In 100 cycles (300 months or 25 years) it will be out of step .5 months. In 200 cycles (600 months) it will be out of step one month, or a third of a cycle.

Assuming he has fitted his 3.050-month cycle as well as may be to the entire series of 1176 months the fit will be pretty good in the middle but about a month out at the ends—just where you want to use it. This is going to reduce the accuracy of the forecast.

5. In some instances Hughey may have discovered cyclic behavior which is the result of cyclic causes closely related to each other in time span. Cycles caused in this way fade out and reappear upside down. Obviously such cycles included in a projection right side up will introduce an error when the "false" cycle fades out and reverses.

Some Long Cycles May Not Be Real

6. Hughey isolated a number of long cycles which have not repeated themselves often enough to justify any assumptions in regard to their reality. By including the long cycles he was able to make his synthesis fit the behavior from 1854 to date much more closely than it would otherwise have done. Fitting the over-all curve more closely helps you to compare the shorter moves more easily, and is thus justified. However the projection of these long cycles is of no significance until we can learn, from the study of long series of tree ring figures or otherwise, that cycles of these longer lengths really do exist.

7. Finally, even if the cycle analysis had been made by an omniscient Being, and could be counted upon to be correct in every particular, we would still not expect it to be more than a partial forecast of the future. Cyclic forces cannot possibly account for all the ups and downs of the market. Sporadic accidental factors have their influence too. The most we can hope from a cycle analysis is that it will throw some light on the future and that it will be more right than wrong.

Forecast Has Worked

For all these reasons I do not feel that, until it has proved itself, Hughey's forecast is necessarily good enough for a prudent man to follow in the purchase and sale of stocks,—nor, incidentally, do I consider the forecast of anybody else good enough, either. However, I am **much** encouraged by the way in which the market in general has conformed for the last ten months to Hughey's projection made last April. If it continues to work, we can and should place more and more reliance upon it. Moreover in the meantime we can and should improve it. This I am trying to do by means of intensive studies of particular cycles, and so is Mr. Hughey.

The fact that Hughey's projection of stock market cycles made in 1951 and my projection of stock market cycles made in 1944 do not agree may bother you. Lest it bothers you I had best repeat some remarks on this subject made in my report for April 1952:

"I want to answer several requests asking me to explain why my stock market projection and Mr. Hughey's projection differ.

The Dewey vs. the Predix Projections

In referring to the Dewey vs. the Hughey projection, I have in mind, of course, a synthesis which I published in the June 1951 and September 1951 reports and a similar synthesis published by Mr. Vedder Hughey of Coral Gables, Florida, under the pseudonym of Predix.

One important difference between Hughey's projection and mine is the fact that Hughey's synthesis includes two important short-term cycles, both of which he diagrams as going down at the present time, whereas my synthesis contained no cycles less than 4.89 years in length.

Mr. Hughey's synthesis does not contradict mine; it supplements it.

Let me give you an analogy. Suppose I had made a reconnaissance survey of the height of the land above sea level, starting at New York and going westward. I might have discovered that for the first 50 miles the land averaged 50 feet above sea level, that for the next 50 miles it averaged 300 feet above sea level, and so on. This broad picture might be quite correct, but a more detailed survey would show wide variations from the averages. The hills would rise way above the average; the valleys would dip way beneath it.

This analogy applies to the surveys of market cycles made by Hughey and by me. Using only the longer cycles, my synthesis could not possibly be right for short-term moves. It was not designed to be.

A second difference between the two jobs is that mine was strictly preliminary and made for purposes of general reconnaissance only. My job took me only about three months to complete. Hughey, on the other hand, attempted to do a finished job. It took him about two year's time and, in addition, he had the aid of extensive IBM machine calculations.

I have explained time and again that my synthesis was merely a preliminary "mock-up" of some cycles which might be present in the stock market and that it was not to be relied upon as a forecast. In fact, I went further and said that the chart was printed "chiefly to show that these other cycles, if they exist, [and I put "if they exist" in bold face type] could badly distort the low of the 9.2-year cycle," which was described in detail in the June 1951 issue.

The ideal 9.2-year cycle is going up at the present time. Thus, if you knew only about the 9.2-year cycle you would be bullish. To counteract any such impression, I published an old synthesis which I had made some years before which showed that other cycles could completely wipe out the effect of the 9.2-year cycle, and might very easily do so in the present instance.

A third difference between Mr. Hughey's work and mine is that in his synthesis he used 19 cycles, whereas I used but 10.

This inclusion of other cycles is bound to make a difference in the projection and would, of course, make Hughey's projection better than mine if the additional cycles are real and continue.

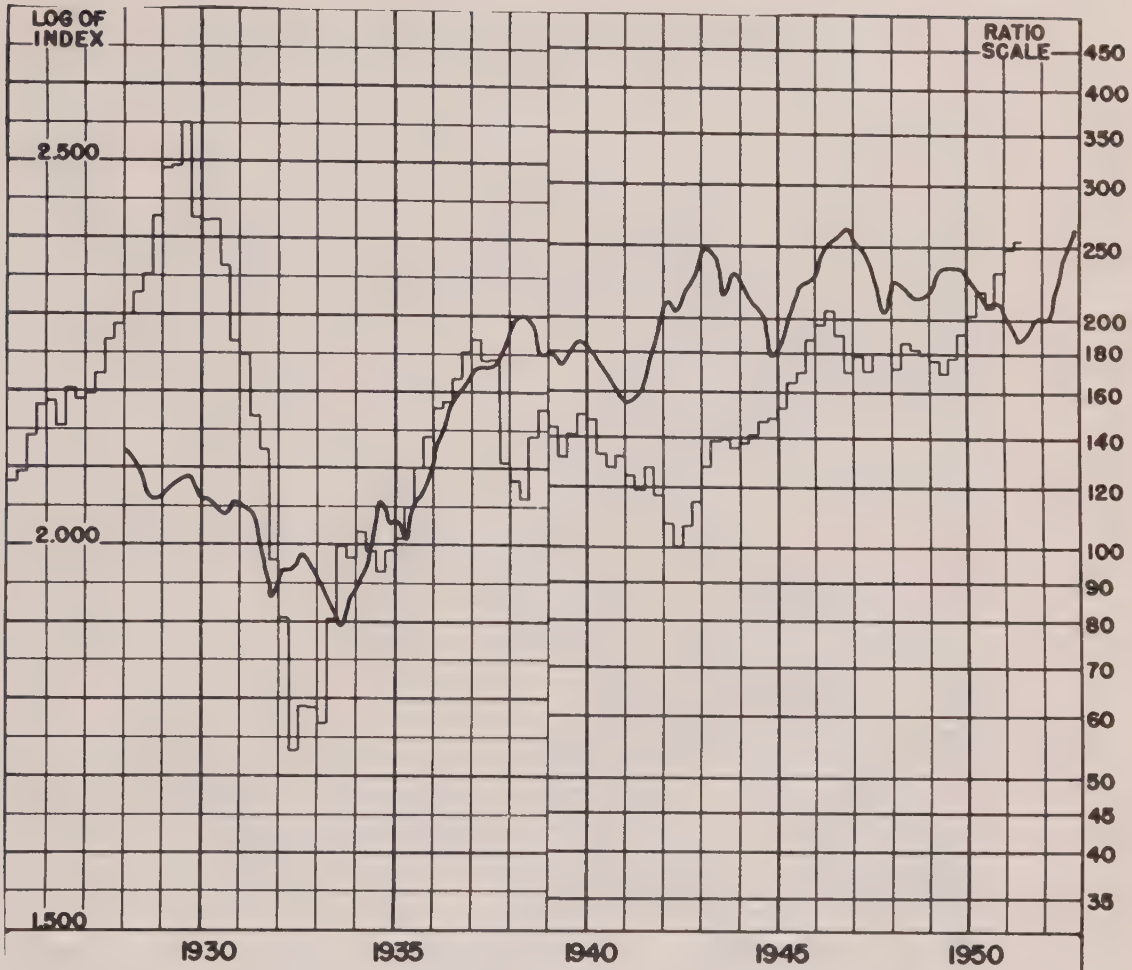
Hughey's synthesis should be better than mine but, as I have said before, neither projection is good enough for a prudent man to follow. Hughey's forecast is, however, worthy of the most serious attention of cycle students because, in my opinion, it is the best job along these lines that has been done to date.

PREDIX Forecast Improved

The above quotation was written after the publication of the first of the three charts referred to above. Since that time the two additional charts, incorporating the results of Mr. Hughey's research in respect to medium and short-term cycles, have been added to the synthesis. These provide a better fit to past behavior and, everybody hopes, will provide a better forecast as well.

It may be said in passing that these hopes have been abundantly fulfilled, at least from April 1952 to date of writing. You will be able to see this for yourself when, in April and May respectively, we publish Mr. Hughey's medium and short-length cycles and his revised synthesis, including these additional cycles.

A TEST FORECAST

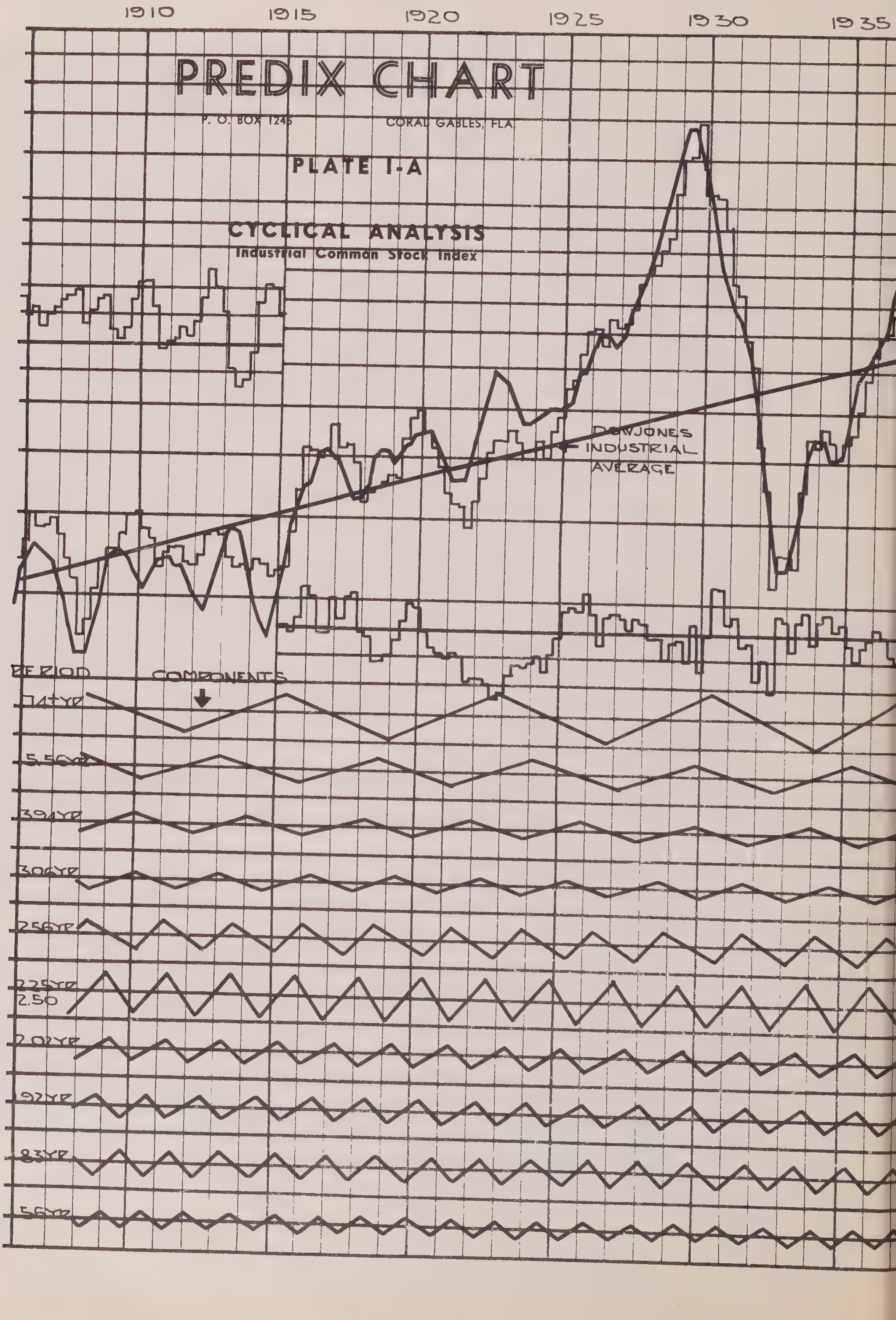


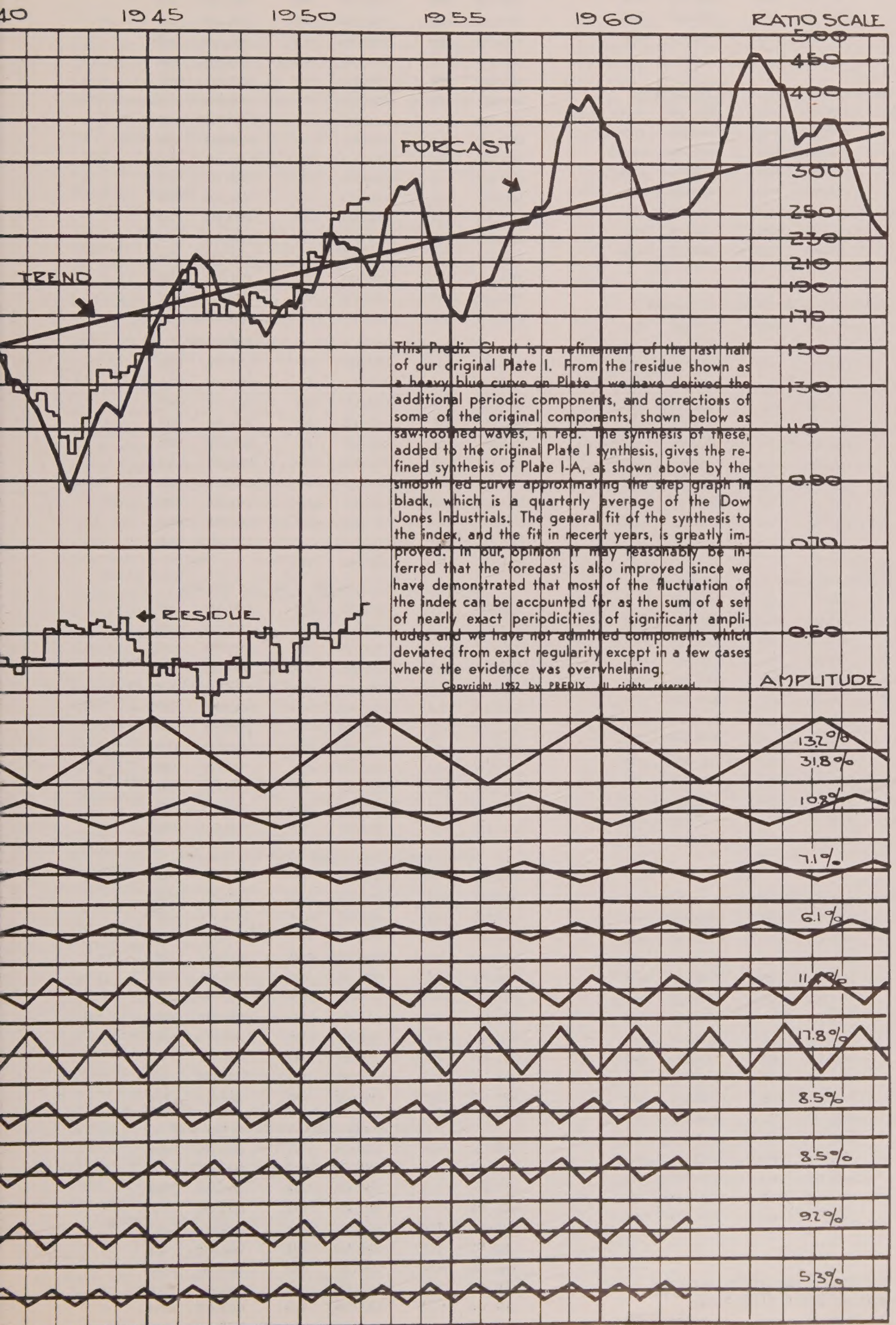
A test forecast of the industrial common stock index from the first quarter of 1928 thru the year 1953 based only on prior data. Due to the particular method used the forecast is actually based on data no later than 1915.

Specifically the forecast is a 2 item - 37 year moving average of quarterly data, projected 37 years and increased by an amount equal to the average increase in long term trend over a period of 55½ years. This is the simplest possible type of periodogram analysis.

The justification for applying this particular method lies in the fact that a preliminary testing of the index for periodic content reveals a number of waves most of which are approximate harmonics of 37 years Hence every 37 years should approximately repeat, if long term-trend is added.

In this test forecast it seems rather significant that a downturn is indicated before 1929 and a bottom within a year of the actual low. This is followed by major market moves and turning points of fair approximation to actual market action. Such a test is a very crude approach to the elaborate analysis involved in the Predix Chart itself but should assure the doubters as to the existence of real periodic content and forecasting possibilities inherent in this time series.


1910
1915
1920
1925
1930
1935
PREDIX CHART
P. O. BOX 1246
CORAL GABLES, FLA.
PLATE I-A
CYCLICAL ANALYSIS
Industrial Common Stock Index
DOW JONES INDUSTRIAL AVERAGE
PERIOD
COMPONENTS
7.4+YR
5.56YR
3.94YR
3.06YR
2.56YR
2.25YR
2.50
2.02YR
.92YR
.83YR
.56YR



This Predix Chart is a refinement of the last half of our original Plate I. From the residue shown as a heavy blue curve on Plate I we have derived the additional periodic components, and corrections of some of the original components, shown below as saw-toothed waves, in red. The synthesis of these, added to the original Plate I synthesis, gives the refined synthesis of Plate I-A, as shown above by the smooth red curve approximating the step graph in black, which is a quarterly average of the Dow Jones Industrials. The general fit of the synthesis to the index, and the fit in recent years, is greatly improved. In our opinion it may reasonably be inferred that the forecast is also improved since we have demonstrated that most of the fluctuation of the index can be accounted for as the sum of a set of nearly exact periodicities of significant amplitudes and we have not admitted components which deviated from exact regularity except in a few cases where the evidence was overwhelming.

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TOP AND BOTTOM TURNING POINTS OF THE 7.4+ YEAR COMPOUND WAVE (COMPRISING A CORRECTION OF THE 7.22 AND 7.70 YEAR WAVES PLUS A COMPONENT OF ABOUT 7.4+ PERIOD LENGTH)

1904.375	-028	1908.125	+028	1911.875	-034
1915.375	+034	1919.125	-040	1922.875	+040
1926.625	-046	1930.375	+046	1934.125	-052
1937.625	+052	1941.375	-058	1945.125	+058
1948.875	-064	1952.375	+064	1956.125	-058
1959.875	+058	1963.625	-052	1967.375	+052

TOP AND BOTTOM TURNING POINTS OF THE 5.56 YEAR WAVE

1904.875	-023	1907.625	+023	1910.325	-023
1913.125	+023	1915.875	-023	1918.625	+023
1921.375	-023	1924.125	+023	1927.125	-023
1929.875	+023	1932.625	-023	1935.375	+023
1938.125	-023	1940.875	+023	1943.625	-023
1946.375	+023	1949.375	-023	1952.125	+023
1954.875	-023	1957.625	+023	1960.375	-023
1963.125	+023	1965.875	-023	1968.625	+023

TOP AND BOTTOM TURNING POINTS OF THE 3.94 YEAR WAVE

1904.125	-015	1906.125	+015	1908.125	-015
1910.125	+015	1912.125	-015	1914.125	+015
1916.125	-015	1918.125	+015	1919.875	-015
1921.875	+015	1923.875	-015	1925.875	+015
1927.875	-015	1929.875	+015	1931.875	-015
1933.875	+015	1935.625	-015	1937.625	+015
1939.625	-015	1941.625	+015	1943.625	-015
1945.625	+015	1947.625	-015	1949.625	+015
1951.375	-015	1953.375	+015	1955.375	-015
1957.375	+015	1959.375	-015	1961.375	+015
1963.375	-015	1965.375	+015	1967.125	-015

TOP AND BOTTOM TURNING POINTS OF THE 3.06 YEAR WAVE

1904.125	+013	1905.625	-013	1907.125	+013
1908.625	-013	1910.125	+013	1911.625	-013
1913.125	+013	1914.625	-013	1916.375	+013
1917.875	-013	1919.375	+013	1920.875	-013
1922.375	+013	1923.875	-013	1925.375	+013
1926.875	-013	1928.625	+013	1930.125	-013
1931.625	+013	1933.125	-013	1934.625	+013
1936.125	-013	1937.625	+013	1939.125	-013
1940.875	+013	1942.375	-013	1943.875	+013
1945.375	-013	1946.875	+013	1948.375	-013
1949.875	+013	1951.375	-013	1953.125	+013
1954.625	-013	1956.125	+013	1957.625	-013
1959.125	+013	1960.625	-013	1962.125	+013

TOP AND BOTTOM TURNING POINTS OF THE 2.56 YEAR WAVE

1904.875	-024	1905.875	+024	1907.375	-024
1908.375	+024	1910.125	-024	1911.125	+024
1912.625	-024	1913.625	+024	1915.125	-024
1916.125	+024	1917.625	-024	1918.625	+024
1920.375	-024	1921.375	+024	1922.875	-024
1923.875	+024	1925.375	-024	1926.375	+024
1927.875	-024	1928.875	+024	1930.625	-024
1931.625	+024	1933.125	-024	1934.125	+024
1935.625	-024	1936.625	+024	1938.125	-024
1939.125	+024	1940.875	-024	1941.875	+024
1943.375	-024	1944.375	+024	1945.875	-024
1946.875	+024	1948.375	-024	1949.375	+024
1951.125	-024	1952.125	+024	1953.625	-024
1954.625	+024	1956.125	-024	1957.125	+024
1958.625	-024	1959.625	+024	1961.375	-024
1962.375	+024	1963.875	-024	1964.875	+024

CORRECTION OF THE 16.00 YEAR WAVE (NOT DIAGRAMMED ON PLATE I-A, A REDUCTION IN AMPLITUDE AND CHANGE IN SHAPE AND DATES OF TURNING POINTS)

1903.125	+056	1914.125	-056	1919.125	+056
1930.125	-056	1935.125	+056	1946.125	-056
1951.125	+056	1962.125	-056	1967.125	+056

THE 2.56 YEAR WAVE AND THE 2.25-2.50 YEAR WAVE COMPRISE TOGETHER A COMPOUND WAVE OF THREE OR MORE COMPONENTS WHICH ARE VERY DIFFICULT TO SEPARATE AND EXACTLY IDENTIFY. THE SUM OF THE TWO WAVES SHOWN VERY WELL APPROXIMATES THE TOTAL EFFECT OF THE COMPOUND WAVE

TOP AND BOTTOM TURNING POINTS OF THE 2.25-.50 YEAR WAVE

1905.625	-037	1906.875	+037	1907.875	-037
1909.125	+037	1910.125	-037	1911.375	+037
1912.375	-037	1913.625	+037	1914.625	-037
1915.875	+037	1916.875	-037	1918.125	+037
1919.125	-037	1920.375	+037	1921.375	-037
1922.125	+037	1923.625	-037	1924.875	+037
1925.875	-037	1927.125	+037	1928.125	-037
1929.375	+037	1930.375	-037	1931.625	+037
1932.625	-037	1933.875	+037	1934.875	-037
1936.125	+037	1937.375	-037	1938.625	+037
1939.875	-037	1941.125	+037	1942.375	-037
1943.625	+037	1944.875	-037	1946.125	+037
1947.375	-037	1948.625	+037	1949.875	-037
1951.125	+037	1952.375	-037	1953.625	+037
1954.875	-037	1956.125	+037	1957.375	-037
1958.625	+037	1959.875	-037	1961.125	+037
1962.375	-037	1963.625	+037	1964.875	-037
1966.125	+037	1967.375	-037	1968.625	+037

TOP AND BOTTOM TURNING POINTS OF THE 2.02 YEAR WAVE

1905.375	+018	1906.125	-018	1907.375	+018
1908.125	-018	1909.375	+018	1910.125	-018
1911.375	+018	1912.125	-018	1913.375	+018
1914.125	-018	1915.375	+018	1942.375	-018
1943.625	+018	1944.325	-018	1945.625	+018
1946.375	-018	1947.625	+018	1948.375	-018
1949.625	+018	1950.375	-018	1951.875	+018
1952.625	-018	1953.875	+018	1954.625	-018
1955.875	+018	1956.625	-018	1957.875	+018
1958.625	-018	1959.875	+018	1960.625	-018
1961.875	+018	1962.625	-018		

TOP AND BOTTOM TURNING POINTS OF THE 1.92 YEAR WAVE

1905.625	-018	1906.875	+018	1907.625	-018
1908.875	+018	1909.625	-018	1910.625	+018
1911.375	-018	1912.625	+018	1913.375	-018
1914.625	+018	1915.375	-018	1916.625	+018
1940.375	-018	1941.375	+018	1942.125	-018
1943.375	+018	1944.125	-018	1945.375	+018
1946.125	-018	1947.125	+018	1948.875	-018
1949.125	+018	1949.875	-018	1951.125	+018
1951.875	-018	1952.875	+018	1953.625	-018
1954.875	+018	1955.625	-018	1956.875	+018
1957.625	-018	1958.625	+018	1959.375	-018
1960.625	+018	1961.375	-018	1962.625	+018

TOP AND BOTTOM TURNING POINTS OF THE 1.83 YEAR WAVE

1905.125	-020	1906.125	+020	1906.875	-020
1907.875	+020	1908.875	-020	1909.875	+020
1910.625	-020	1911.625	+020	1912.375	-020
1913.375	+020	1914.375	-020	1915.375	+020
1941.625	-020	1942.625	+020	1943.625	-020
1944.625	+020	1945.375	-020	1946.375	+020
1947.125	-020	1948.125	+020	1949.125	-020
1950.125	+020	1950.875	-020	1951.875	+020
1952.625	-020	1953.625	+020	1954.625	-020
1955.625	+020	1956.375	-020	1957.375	+020
1958.125	-020	1959.125	+020	1960.125	-020
1961.125	+020	1961.875	-020	1962.875	+020

TOP AND BOTTOM TURNING POINTS OF THE 1.56 YEAR WAVE

1905.125	-012	1905.875	+012	1906.625	-012
1907.625	+012	1908.375	-012	1909.125	+012
1909.875	-012	1910.625	+012	1911.375	-012
1912.125	+012	1912.875	-012	1913.875	+012
1944.875	+012	1945.625	-012	1946.625	+012
1947.375	-012	1948.125	+012	1948.875	-012
1949.625	+012	1950.375	-012	1951.125	+012
1951.875	-012	1952.875	+012	1953.625	-012
1954.375	+012	1955.125	-012	1955.875	+012
1956.625	-012	1957.375	+012	1958.125	-012
1959.125	+012	1959.875	-012	1960.625	+012
1961.375	-012	1962.125	+012	1962.875	-012

GLOSSARY

Cycle, coming from a Greek word meaning circle, implies coming around to the place of beginning. Strictly speaking, in the word itself there is no necessary implication of regularity, but the word is often used loosely to denote rhythm or periodicity.

When the word cycle is modified by a time interval such as 6-year cycle, 20-month cycle, 17-day cycle, the phrase usually means a cycle that recurs with reasonable regularity. In other words, it denotes rhythm.

Rhythm, coming from a Greek word meaning measured time, implies a beat, or a tendency toward perfect regularity or periodicity. It is what we really mean on most of the occasions when we use the word cycle.

Cycle analysis, as we are using the term in this bulletin, should really be called rhythm analysis, as we are concerned with **rhythmic cycles**--cycles that recur with a beat.

Periodicity, in the strict sense, is the quality of being regularly recurrent. It is a quality not often found in nature. The ideal cycles which are often added to a chart to diagram a rhythmic cycle are true periodicities.

A **wave** is one single cycle or undulation. Waves have **frequency**, **amplitude**, **period**, and, at least when they represent harmonic curves, **phase**.

Frequency is the number of complete vibrations to and fro--i.e. waves--per second It is a term not used by cycle analysts when dealing with cycles that are over a second in length.

Amplitude is the extent of a vibratory movement measured from the average position to an extreme position; that is, it is the height or depth of the wave above or below the axis around which the wave oscillates.

Positive amplitude is the distance above the axis, **negative amplitude** is the distance below the axis, **overall amplitude** is the sum of the positive and negative amplitudes. Amplitudes may be expressed in absolute units or as a percentage of the value of the axis.

Period is the interval of time required for a periodic motion to complete a cycle and begin to repeat itself. It is the length of the wave from crest to crest or trough to trough or from some other point on the curve taken as the **epoch**. The **epoch** is the point on the curve chosen as the beginning of the wave. In physics and astronomy it is usually taken as the point where the curve crosses the axis on its upward motion, but it may be any other point as well.

Phase, in a simple harmonic curve, is the point or stage in the period to which the oscillation has advanced considered in relation to a standard position or assumed instant of starting. It is measured along the axis, usually in degrees. By extension of meaning, **positive phase** is therefore the part of the wave above the axis or trend, and **negative phase** is the part of the wave below the axis or trend. When the crests (or troughs) of two or more different series of waves come at the same time, the waves are said to be **in phase** with each other. When the crests of one series of waves coincide with the troughs of another series, the series are spoken of as in **reverse phase**.

A **simple harmonic curve** referred to once or twice above, is the curve you would get by tracing the motion of a pendulum upon a piece of smoked paper that was moving at uniform speed at right angles to the direction in which the pendulum was swaying back and forth. It is perfectly simple, regular, and symmetrical and, in mathematical study, is usually referred to as a **sine curve**. A single oscillation is called a **sine wave**.

A **rectilinear** or **saw-tooth wave**, on the other hand, is a wave the sides of which are straight lines; in other words, zigzag.

Trend is the tendency of data in a series to increase or decrease during a long period of time. The expression, "a long period of time," cannot be defined except relatively. If you are dealing with hourly figures, you might consider trend as the general direction over the past 30 or 40 hours. With yearly figures "trend" might mean the general tendency over the past 100 years or more.

An **average** is a typical value which tends to sum up or describe a number of figures. There are at least five different kinds of averages commonly used by statisticians; but the one which ordinary folk think about when they hear the word **average** is the one computed by adding all the items together and dividing the total by the number of items. Thus, if we have four items, 10, 12, 11, and 13, the average of these items is 10 + 12 + 11 + 13 (46) divided by 4, or 11½. An average of this sort is more accurately called the **arithmetic mean**.

An arrangement of numbers is called a **series**.

When the numbers with which we deal represent events which occur one after another in time, the arrangement is called a **time series**. Thus, in the example above, if 10, 12, 11, and 13 represent the price of cotton for each of four consecutive years, or represent the number of accidents on each of four consecutive days, you would call the numbers by this name--a time series.

You could still average the numbers and say, for example, that the average price for all four years was 11½ cents, or that during the period there was an average of 11½ accidents per day, as the case might be.

You could also say that the average price for the first three years was 11 cents, (10 + 12 + 11 (33) divided by 3) and that the average price for the last three years was 12 cents (22 + 11 + 13 (36) divided by 3).

A **moving average** is a succession of averages secured from a series of numbers by dropping the first number (item) in each group averaged and including the next number in the series after the group, thus obtaining the next group to be averaged, and so on.

Thus, when you averaged the first three numbers of our time series (10, 12, and 11) and got 11, and then dropped the first number (10) and added the fourth number (13) and averaged again and got 12, you were constructing a moving average

Because you were averaging three items at a time, you would call the result a 3-item or 3-term moving average. If the items represented yearly values you would call the result a 3-year moving average. If the items represented daily values, you would call the result a 3-day moving average.

The **moving total** is the series of successive totals from which the moving average is computed. For example: When , above, you added 10, 12, and 11 to get 33, and then added 12, 11, and 13 to get 36 (as a step in the task of getting 11 and 12, the two terms of the moving average), you were computing a moving total.

ANNOUNCING TWO NEW PREDIX PLATES!

PLATE III A TEST FORECAST OF THE RAIL STOCKS

Using the first 102 years of Mr. Dewey's Composite Rail Stock Index, as published in the April 1952 issue of "Cycles," we have attempted to forecast the last twenty years, using the prior data and projecting all the periodic content we derive from this.

In the last analysis, cycle theory will stand or fall on the average performance of actual attempted forecasts. Not many series are long enough to take the early part and try to forecast the last part. But the Rail Stock Index is, and so, as much to convince ourselves as you, we took up the task of wrestling this one through to whatever conclusion might be forthcoming.

As this ad is written, the work is incomplete and PREDIX hasn't the faintest idea how the test forecast will turn out. But, win, lose or draw, we are going to publish the result. We are determined to prove either that cycles do work, or don't work, and let the chips fall where they may. We are compelled by the inevitable costs involved to ask anyone interested to send Two Dollars ($2.00) if they would like to see this honest test and appraisal of applied cycle theory, together with a detailed description of all methods and how each problem was met and handled as it arose during the course of analysis.

We are strictly guessing, but we think the results will be exciting, so please hurry and send that: **$2.00**

PREDIX PLATE III consists of three 11x17 multi-color plates and twenty page explanatory booklet. The entire analysis was converted to Dow Jones Rail Stock Average and a current forecast, described below, developed and here offered.

PLATE III-A A CURRENT FORECAST OF THE RAIL STOCKS

The Dow Jones Rail Stock Average 1897 to date together with a preliminary projection of periodic content through 1960. Plate III-A is 11x17 and in three colors: **$4.00**

Those interested in both charts need send only: $5.00

PREDIX

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